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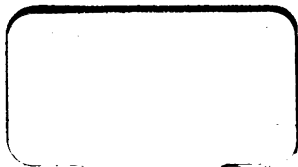
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STANDARD AMERICAN



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UNIVERSITY OF WISCONSIN
Perfection Poultry Book

BY I. K. FELCH.

J. REGAN & COMPANY, Publishers
CHICAGO.

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Describing All of the Different Varieties of Fowls,
Their Points of Beauty and Their
Merits as Setters

By I. K. FELCH

The Recognized American Authority on Poultry Matters
and Author of "POULTRY CULTURE."



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PART I.

CHAPTER I.

INTRODUCTION.

IN 1873 we made our maiden speech on "POULTRY CULTURE AS A FARM PRODUCT." We shall never forget the look of incredulity and surprise depicted on the faces of the four hundred farmers who listened to us on that occasion. The following is the substance of that speech :

Although the poultry interest of the nation has been considered of minor importance, yet when we investigate we find the egg and poultry product to be much larger than any other agricultural product or industry, and we become amazed at the amount of wealth annually accumulated by practical poultry keeping.

The census for 1870 informs us that the cotton crop was 3,011,996 bales ; the corn crop, 761,000,000 bushels ; the wheat crop, 288,000,000 bushels ; the value of all the cattle, sheep, and swine slaughtered or sold to be slaughtered was \$398,956,376 ; the hay crop, 28,000,000 tons, valued at \$14 (a high estimate), was \$384,000,000.

The assertion that the egg and poultry produce of the States exceeds either of these large products is

met with derision ; yet it is true, and the produce finds no rival save in the entire meat and dairy products combined.

Compute the nine millions of families in the States as consuming but two dozen eggs per week, and twenty dollars' worth of poultry per year, and we have (computing eggs at twenty-five cents per dozen) over \$405,000,000. Nor is this all. Large as it is, to it must be added the consumption by the saloons, restaurants, confectionery establishments, our thousands of hotels, together with the medicinal and chemical and exportation demands, which will swell the amount to not less than five hundred millions of dollars as the annual product of the United States; an interest worthy of our considerate investigation. When we commence to make figures, we become surprised at their magnitude; and that you may not underrate the hotel consumption, you have only to consult the encyclopedias to learn that the hotels consumed sixty-two millions four hundred and eighty-three thousand dollars' worth of eggs and poultry for the year 1879. There must, of course, have been a great increase since that time.

The consumption of meat to each guest per day at the Grand Pacific, the proprietor of the hotel informs us, is \$2.50, and two-thirds of that amount is for poultry, game and eggs. Another item should be considered in this connection, and that is, thousands of prairie farmers, who live so remote as to make the running of meat-wagons unprofitable, are obliged to rely on their farms for fresh meat, and it is a fact that two-thirds of it is poultry and eggs. It is the custom with them in early winter to kill and pack in snow and ice the sup-

plies of poultry for home use. This, with the richer third of the population who consume far more than the estimate offered, will more than make up for the poor of our eastern cities, who consider poultry a luxury and seldom indulge in its use. With these items as data, we claim our estimate of five hundred millions to be far less, rather than more, than the actual yearly product, which, as we have said, makes the industry of poultry breeding and keeping one of the largest in which our farmers are interested. Like in comparison as the giant oak to its acorn origin is this large product, made up from the small collections from the small flocks of fowls seen about the doors of the hamlet and farmhouse in numbers of twelve, twenty, thirty and fifty, and where a larger number is seen so rarely that they become the exception. These flocks pay a large profit on their cost of production, as may be seen by consulting the different societies' reports. In 1858, we see that thirty-eight fowls, kept in small yards, under unfavorable circumstances, with a market at thirty-eight cents for corn, sixteen and two-thirds cents for eggs, and fifteen cents per pound for poultry, yielded a net profit of \$1.38 per head. In 1861, Mr. Mansfield's experiment with one hundred hens, having a free range of the farm, consuming but ninety-three bushels of corn or its equivalent, produced one hundred and forty-seven eggs each (no chickens being raised that year), and yielded a net profit on eggs alone of \$1.35 per head; to which, had the value of the guano been added, the figures would have reached the sum of \$1.60. These and other statements are to be found in the Middlesex South Society's reports, of \$2, \$2.25 and \$2.50 per head

profit per annum; and last, but not least, the banner statement of Mr. Whitman in 1873. With fifty-one Leghorns, which laid two hundred and seven eggs each, which he sold for thirty-one cents per dozen, the cost of keeping the fowls being \$1.13 each, he shows a profit of \$4.04 per head, proving conclusively that these small flocks pay much better with care than do other farm stock.

We have no reason to change our opinion, for the amount must be increasing each year. We as a nation are consuming more poultry and eggs every year. We are not alone in our belief of the magnitude or in our faith in the future of this immense interest or industry, and we subjoin from the pen of the able writer, Captain J. E. White, an article on the future capabilities of the country in poultry breeding as compared with other countries.

POULTRY AND EGG PRODUCTION—A SOURCE OF
WEALTH TO THE PEOPLE.

France is, perhaps, the only nation that recognizes the poultry and egg trade as a source of wealth to its people, and protects and encourages it as it would any other business which brings a revenue to, and betters the financial condition of, its citizens. Under this fostering care the poultry and egg trade of that country has grown year by year until it has reached gigantic proportions—not only meeting the demands made upon it for home consumption, but also supplying English markets with more than \$13,000,000 worth of this class of food annually. The value of eggs and poultry sold in home markets and consumed by the

French people is estimated at \$110,000,000; add to this the exports to England and we have \$123,000,000, which represents an industry that is looked upon by too many of our farmers and business men as being "too insignificant to merit consideration." It must be borne in mind that this \$123,000,000 represents only the eggs and poultry consumed annually—it does not include the stock carried over to begin business upon the following year. The value of the stock on hand—which is carried over for the purpose mentioned—is estimated at about \$45,000,000, thus showing that the annual poultry and egg production of France amounts to \$168,000,000.

Doubtless most of those who may read this article will conclude—when they reach this point—that no other nation is as productive in this particular as the French, but the facts, supported by reasonable estimates, demonstrate that the United States are vastly more so. "In 1878 a convention of butter, cheese and egg producers was held in Chicago; the most careful and reliable statistical reports that could be gathered relating to these products were placed before this convention; from them we find that the annual production of eggs was valued at \$180,000,000, and poultry sold at \$70,000,000." Thus, according to this report, which I shall presently show to be incorrect, \$250,000,000 were annually realized from a business "too insignificant to merit consideration." To some it will sound like one of Munchausen's stories, but to those who are in the business and understand something of its magnitude, it seems like a too modest tale; it does not tell half the story. The population of the United States is more

than fifty millions. If each one of this population were to eat an egg to-day there would be consumed in eggs alone, at the present market price, \$1,000,000; and if each one were to eat an egg each day for a year, the consumption of this one article of food would amount in the aggregate to \$365,000,000; add to this the value of the poultry consumed, which is estimated at \$121,666,648, and it will be seen that the eggs and poultry consumed in the United States annually represent a money value of \$486,666,648; add to this \$45,000,000, the value of the stock carried over, and to this the sum realized from sales of fancy fowls and eggs, which is not less than \$500,000 annually, and you have the enormous sum of \$532,166,648, which is \$32,000,000 more than the value of the corn crop of the United States for 1879, and \$189,842,857 more than the wheat crop of the same year. But some "doubting Thomas" will say that there are thousands of our people who do not eat an egg each day. Granting this to be true, we must face the fact that many other thousands eat from two to four daily, and that eggs enter very largely into the composition of many articles of food which we consume each day, such as cakes, pies, salads, coffee, custards and puddings; and we must not neglect to include in our account the eggs used in saloons, and for medicinal and chemical purposes.

Perhaps there are few of our professional men, clerks and merchants, who, when they run like wild men to a restaurant and order a cup of coffee and a piece of pie, stop to think that when they have finished their lunch they have rendered unfit for incubation two or three eggs; but such is the fact. Then we are not

so certain that there are many thousands of our people who do not consume eggs or poultry in some form daily. We might jump to the conclusion that our poorer classes could not afford it; but it would be a jump in the wrong direction, for whoever has traveled and been ordinarily observant has noticed that the poor almost always keep poultry. This estimate is based upon the supposition that the average price of eggs, the year round, is but twenty-four cents per dozen; and this supposition, I venture to say, is not sustained by the facts, because at most times in the year—during the winter, fall and latter part of summer—they bring, in our own markets, from thirty-five to fifty cents per dozen, and in eastern markets from fifty to sixty-five cents, the price, of course, depending upon the supply and demand. Many of the eastern hotels make contracts with those who keep large flocks of fowls to furnish them so many dozen of eggs and so many pounds of dressed poultry daily, and pay for these eggs, in consideration of their being fresh laid, from forty to sixty cents per dozen.

STARTLING FACTS.

We are further indebted to Mr. James E. White for the following array of facts, which will be read with great interest:

If France, with an area of 204,147 square miles, of which only 98,460 is capable of cultivation, realizes more than \$200,000,000 annually from her poultry interests, it can easily be seen that the United States, with an area of 3,587,681 square miles, of which 1,700,000 is capable of cultivation, should with the same care

and labor realize from the same source \$3,264,000,000 annually. But, of course, in order to make the conditions equal, it would be necessary for the United States to be as densely populated as France.

The present population of that country is 38,905,788, which would give each individual—if an equal division of the land was made—two acres of soil capable of cultivation; whereas, the population of the United States is 55,000,000, which, under the same allotment, would give about twenty acres of good land to each inhabitant; hence, this country is as capable of sustaining a population of 550,000,000 as France is of sustaining her present population, and if the production per capita only equals that of France, the sum total annually would be \$3,264,000,000. But it has been shown that the production and consumption of this class of food is much larger per capita than it is in France, and if each citizen of the United States consumes as much of this food when our population reaches 550,000,000 as they now do, the annual value of this industry will not be less than \$5,596,000,000.

It will be remarked by those who have not given the food supply of this country thoughtful consideration, or the ultimate population and productiveness that attention which it deserves, that the writer of this article is visionary and enthusiastic; but, my friends, if you look over the figures carefully you will see that the probable extent of this industry, when this country is fully developed, is capable of a correct mathematical solution, and is made on the basis that if 55,000,000 people eat so much in one year, how much will 550,000,000 eat in the same time?

Belgium is one of the smallest powers in Europe; its area is 11,373 square miles, and its population is about 5,253,821. It is the most densely populated country in the whole world, and about 60 per cent of its area is under the most exhaustive cultivation, that being all of it that is capable of producing good crops. In order that the extent of the country may be more fully understood, it may be well to mention the fact that it is not nearly as large as the state of Georgia, while its population is more than three times greater; and this little country produces annually, as shown in the statistics of that country, 274,967,824 eggs—or forty-eight eggs for each man, woman and child in Belgium; and this is accomplished in a country “where the most persistent effort is made to cause the land to produce the food necessary for home consumption, and where a vast amount of labor and money is expended in the cultivation of the soil.”

If such results are obtained under such unfavorable circumstances, what may not be accomplished in a country as favorably situated as ours?

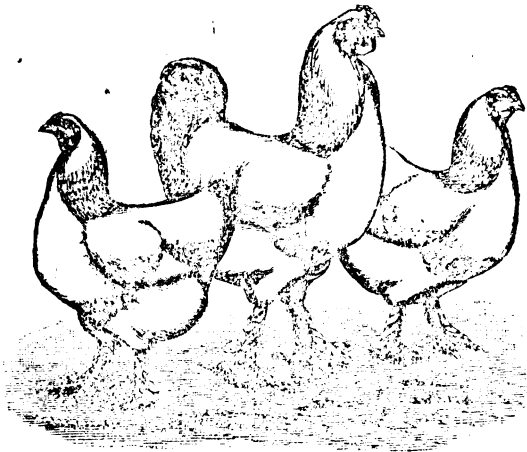
It is the duty of all men who have the development of this country at heart to encourage the greatest possible production of every commodity that we can produce with profit, and among other industries the poultry and egg business must not be neglected. The farmers must be made to understand that the thoroughbred fowls are as much superior to the barn-yard fowls as the Herefords, Jersey and Anguses are to the common cattle that roam over our prairies; and when they understand this, they will improve their fowls.

Much more could be quoted to show the magnitude and the need of the development of this industry as a source of wealth to the nation, but above all this, farmers of America, remember that poultry-keeping has more than a money value for you. Interest your boys in it, for thereby they learn many of the principles that underlie the successful breeding of stock,—fitting them, when older, the better to manage cattle and horses. The rapid production of chickens enables them to try as many experiments in a few years as would take a lifetime with stock. In the breeding of fowls they learn that like produces like more surely, and only, as a rule, where the stock is bred in line, and that to produce chickens uniform in type and color they must have, in both sire and dam, a preponderance of the blood of the desired type; they must mate kindred blood judiciously, avoiding too close relationship,—for by mating fowls of one blood for three generations we produce sterile eggs. They learn that prepotency of sire is more marked in the mating of kindred blood, and in the offspring of dams of weak constitution, and when appearing in the coupling of radically different blood, that it is an exception and not the rule. They learn that the blood most difficult to subjugate, in the end has more lasting quality, and does the flock the most good as a new infusion of blood; these interests, once awakened, cannot slumber; the boys become thoughtful, and as they grow older their assistance becomes much more valuable than any help you can hire.

CHAPTER II.

DESCRIPTION OF FAVORITE BREEDS.

WHILE we show several experiments in our introduction, we may affirm that all the different breeds will pay a handsome profit, if furnished quarters

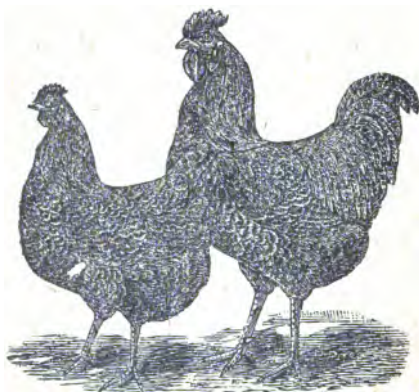


LIGHT BRAHMAS.

suitable for their condition, and properly cared for; and, generally, it is best for the breeder to make a specialty of the kind his taste shall dictate. But with our thirty years' experience with all the so-called thor-

oughbred varieties, we are led to advise, taking into consideration the individual merit and associate worth, the selection of Light Brahmas, Leghorns, Wyandottes and Plymouth Rocks, for they will be found to pay the best for extra care, for all practical uses.

The Brahma is a superior winter layer, producing the larger number of her eggs from October to May. As poultry, the chicks have to be killed quite young,—say eight to ten weeks old, as broilers; the most profitable



PLYMOUTH ROCKS.

time as roasters being at eight months. This makes them late as poultry, but to make up for it in a measure, the virgin cocks are tender enough for roasting at even twelve to thirteen months, more so than the native at seven or eight months. If the males be separated from the females when five months old and fed through till March, when poultry meat invariably advances in price, the breeder will find them sought for by hotel and restaurant keepers, to supply the place of

turkeys, and that they will sell at a price of only about five cents per pound less than capons.

The Plymouth Rocks are good average layers, and in them the poulterer finds an excellent breed from which to produce broilers and summer roasters for our seaside or all summer resorts. In round numbers, ten dozen eggs per year is about what they will each lay, and hatch and raise you a brood of chickens, and in this case



WYANDOTTES.

the brood is gratis, for they will lay less eggs, we think, if deprived of the privilege of indulging in the natural instinct of reproduction.

So long as the breeder of Plymouth Rocks will be content to have them occupy this middle ground between the larger and smaller breeds, and endeavor to increase by breeding to that end the production of large eggs, they will hold their position of favor against all rivals.

The Wyandottes of late have come in for public praise and patronage. They are in the same class with Plymouth Rocks, and become their greatest competitors. Their breeders claim for them *par excellence* as broilers, and the merit of being better layers. In this we would, perhaps, accept the fact that their eggs are larger, but we fear they will not lay as many. What they may develop into in the coming years cannot be foretold. While we would admit them as equals, we

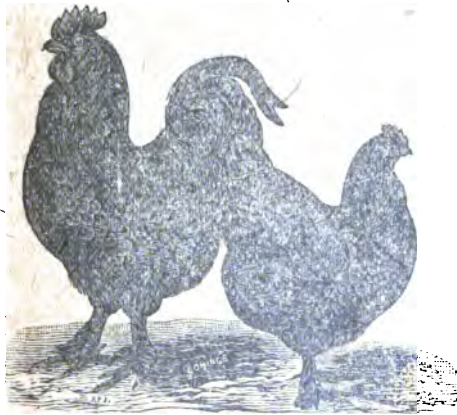


BROWN LEGHORNS.

are not yet ready to accept them as superior to their blue rivals. They are shorter jointed, more blocky, in some cases, and if they settle down to this as a uniform type, and a close-feathered, fine-boned race, they certainly will deserve the boom they are at this writing receiving.

The Leghorns are a non-sitting variety, and one of the largest producers of eggs, being most prolific during the warmer months. Their chickens make nice early,

though small, broilers, and should be killed as such, for as roasters their skin is tough and carcass too small, their chief merit being in egg production alone. They are very quick growers, many pullets commencing to lay at four months and a-half old, and there are cases on record in our own yard where they have laid at three months and three weeks old. We have also started with eggs and produced three generations in three hundred and sixty-three days. This precocity



LANGSHANS.

enables one to raise his stock birds even after the season is too far advanced to rear successfully the larger varieties.

Of the above we consider the Brahma the best of all the Asiatic breeds. The Langshan will lay an egg as large, and perhaps as many of them, and of the same desirable color of shell, but their white skin drives them into a second-rate poultry, as judged by

the New England demand for golden yellow carcasses when dressed.

The Plymouth Rocks and Wyandottes, and we may add possibly for purely practical use the Dominique, are breeds to fill the middle ground, and from which to look for the broiler supply, and the Lēghorns to give us the largest number of eggs in a year, and to produce them in the larger numbers at the time our incubating breeds are busy with the rearing of their chickens.

Thus you see how peculiarly adapted one to the other the four breeds are, and all of them are hardy, standing much neglect. With them the farmer easily caters to the wants of the markets the year round.

With the above breeds as stock the yearly product will average one hundred and fifty eggs and eight chickens to each hen, which will sell (taking Natick market for 1885 as a basis) as follows:

| | |
|--|----------------|
| 12½ dozen eggs, at 25 cents per dozen | \$3 12 |
| 4 pairs of chickens, 28 lbs., at 25 cents per lb. | 7 00 |
| American guano. | 25 |
| Total. | <u>\$10 37</u> |

The cost of producing the same being:

| | |
|---|---------------|
| Keeping of hen. | \$1 15 |
| 15 eggs for incubation | 38 |
| Cost of growing 8 chicks to 35 lbs. live weight, at 9½ cents per pound—..... | 3 32 |
| Interest on investment and casualties | 60 |
| Total. | <u>\$5 45</u> |

These figures may seem high, but for the last ten years the same market has averaged from 31 to 32½ cents per dozen for eggs, and grain has ruled very much lower.

To notice some of the other breeds, we will say "the Hamburg family" is one of merit as egg producers, yielding about one hundred and sixty-five eggs per year, as a rule; and there is a case on record where a single hen of the Golden-Spangled variety laid one hundred and fifty-one eggs in six months. As poultry, the meat and bones are dark, so much so as not to be desired by market-men. The race is delicate, and hard to rear, but when six or eight months old seems to have become quite hardy, except it be a predisposition



SILVER SPANGLED HAMBURGS.

to the disease called "black comb," but why the disease should be so termed we cannot understand. To be sure, the comb turns black, but the causes come from derangement of the egg-producing organs. We have seen them lie down, their combs become black, and they, to all appearance, dead, when all at once they would expel the egg, and in a few moments be singing about the yard as well as ever.

The different varieties of this family are Golden-Spangle, Golden-Penciled, Silver-Spangle, Silver-Pen-

ciled,—this last being the old-time Bolton Gray, under which name it was first imported into this country. The white and black varieties are of more recent date than the first four named; the black we think the most hardy and prolific of them all.

The Spanish was long known as one of the best layers, and in fact the old Minorcas were in every respect equal to the Leghorns, but the breeding of the white face upon this breed has resulted in the fact that much of their merit has been sacrificed. Their eggs



BLACK SPANISH.

are larger than those of any other breed, but in number they fall much behind the average. They are extremely delicate as chicks, but when once matured they seem reasonably hardy; and the contrast of a pure white face and ear-lobe with their metallic, green-black plumage makes them much admired. As poultry, here in America, we would not concede, perhaps, that they were up to the average. Their dark legs and white meat are not preferred by the masses.

The Dominique is every way equal in merit as to number of eggs, and in poultry equally as good, as the Plymouth Rock; it being rather under size compels it to take a second place. In all other points, what has been said for the Plymouth Rocks would apply to the Dominique.

The French class, comprising Houdans, LaFleche and Creve Cœur, while highly appreciated in France, have failed to give general satisfaction in New England. But Mr. Aldrich, of Hyde Park, has been



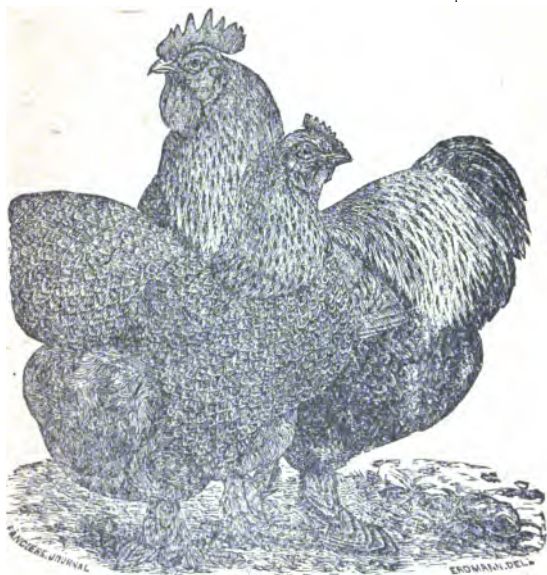
HOUDANS.

successful with the Houdans, and claims for them all that is excellent as table fowls, besides being a good average producer of eggs; they are more inclined to non-sitting than otherwise. But the Houdan and Creve Cœur require warm, dry quarters. They, like the Polish, are inclined to roup if confined in damp quarters.

The LaFleche are the most delicate to rear of the whole class, and in our northern climate are much

troubled with a weakness in their limbs. A good healthy hen of this breed, we believe, will lay more eggs from March to October than any other breed, not excepting the Leghorn.

The Cochins are, in England, much preferred. They are good mothers, being covered with long, fluffy feathers. They are hardy, and as layers in winter are



PARTRIDGE COCHINS.

hard to excel. Their eggs are furnished with a thick shell, and in closely bred birds are extremely hard to hatch. There are the Partridge, Buff, White, and Black varieties, all having their admirers, the Partridge being the most beautiful, while the Black has undoubtedly the most merit, for they are good layers and fine

poultry. For one dollar "The American Standard of Excellence" can be obtained, which gives a full description of the different breeds.

We shall give special attention to description, as to color and type, under the head of "Judging."

The game varieties find many admirers, and for a juicy broiler or a roaster under six months old, and as the mothers of chicks, they have no equal; for the latter, however, we think the cross of a game cock on



BLACK-BREASTED RED GAMES.

a Partridge-Cochin hen pretty and serviceable, as they are more apt to receive all chicks given them to rear. The pure game, while very jealous of the care of her own, is death to all orphans or chickens not hatched by her. The games cannot be said to be first-class layers, as 128 eggs is all we can concede they will produce in a year in small flocks, and if too much crowded they will fall short of these figures. The Bantams, many of

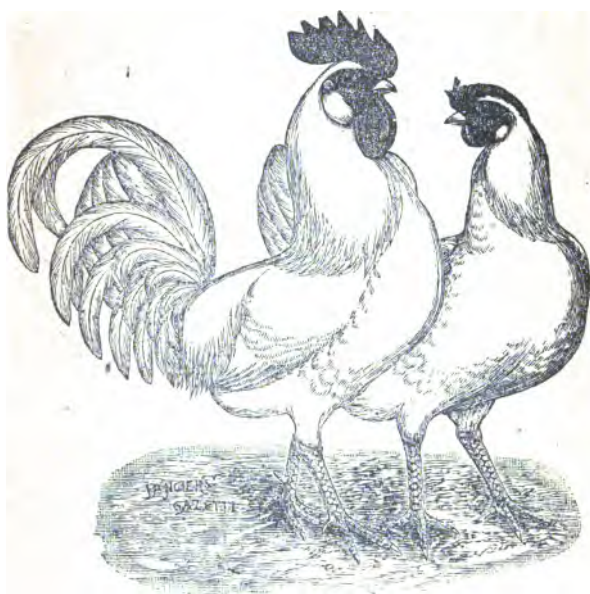
them, lay more and greater weight of eggs in proportion to their own weight than do the larger breeds. Were eggs sold by weight, as they should be, we believe the Brahmas and the Bantams would be better appreciated than now. These Lilliputian hens are nice mothers, and pay to raise for this office alone.

Speaking of the weight of eggs reminds us of seeing weighed the other day twelve taken from a basket of Brahma eggs that weighed two pounds and two ounces, and a dozen taken from a basket of them collected from the native farm stock on the Cape that weighed but one pound and two ounces, just one pound difference. Wherein is the justice of selling them by the dozen? Bantam's eggs will weigh fifteen to the pound, and twenty-two ounces is standard weight for the Bantam hens themselves, while the Brahma pullet of eight pounds was the producer of the two pounds two ounce dozen. Bantam eggs are the smallest in the list, yet they are the largest twice over in proportion to the weight of the producers. It matters not what the breeds are. One bushel of corn or its equivalent in other flesh-growing foods, will produce nine to eleven pounds of live weight in poultry, and one has only to weigh his fowls to approximate their food cost, for cost of care must be added.

When fowls are fed sparingly, being kept short, they become a bill of expense, for there are no stocks that pay so poorly if neglected. But if extra care be taken to furnish them all that nature lavishes in her bounty upon them, there are no creatures in the barn-yard will pay you so well for that care. A greater profit will be realized from all those breeds that hatch and rear their



LIGHT BRAHMAS.



WHITE LEGHORNS.

own young if you allow them each to hatch and rear one brood of chicks during the season, for the incubating season gives the laying functions rest, and you get more eggs, we are confident, in the year, beside the care of the brood of chicks gratis; and as the chicks will pay one hundred per cent profit on their cost, you will find that many of the incubating breeds will pay as well, and even better, than some of the non-sitting varieties. In all breeds it will be found to pay to take pains to make your selections from the best laying families of the breed, for there is as much difference in them as there is in the Shorthorn breed of cattle for milk.

Whichever breed we may select to keep it will not be found well to keep them beyond the second season, as young stock do much better—such yearlings as molt early. One had much better keep thus selecting about a half to carry over into the third year; the balance of the fowls coming two years old should be sold as poultry just before chickens come into market, when they bring a much better price, and their value will replace them with young stock. If the young stock is to be reared on the farm, it will necessitate the rearing of as many chickens as the breeding stock number, for chicks hatch nearly equal as to sex, which only enables you to replace the two-year-old birds each year sent to market.

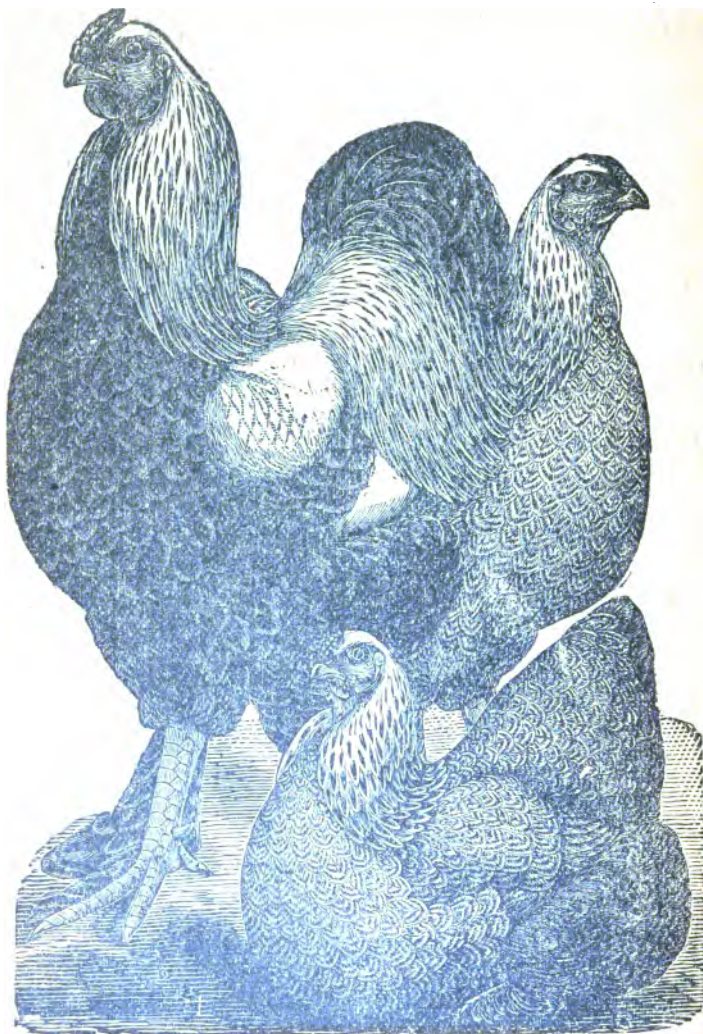
In nearly all the cases where we find people breeding in a practical way, we find them using only what we call native or mongrel stock. This, we believe, is a mistake, for the thoroughbred is worth as much, and many of the breeds far more, for this practical work;

and should all use the thoroughbred, killing, as they do now, one-third for poultry, using the larger number left to produce eggs for the market, using as breeders only the best they raise, selling only for breeding purposes when a fair price (say from two dollars and fifty cents to ten dollars each) could be realized, they would in this way raise the standard and come to learn that in every twelve fowls they kept they had the value of a cow, and caring for them as well they would find they paid as well.

Show us a farmer who is conscious of capital invested in his fowls and we will show you a farmer who makes money out of them. The greater the number raised, the higher the price you will be able to command for the best individual specimens. This has proved true in cattle. (See History of Shorthorn Cattle in America.) It is every day proved in the case of fowls. Twenty-five years ago we sold Light Brahmas at one dollar each, and the price was considered a fair one, the native then selling for thirty-three cents. When the price increased to twenty-five dollars per trio, it became the town talk; but in the past three years, when we have sold cockerels at one hundred dollars, and trios at one hundred and fifty dollars, it has ceased to be a surprise, and really it is not in keeping with bulls at seventeen thousand dollars each. We expect to live to see specimens of superior excellence sold as high as two hundred and fifty dollars. Already, in England, five hundred dollars a trio has been realized.



PARTRIDGE-COCHINS.



DARK BRAHMAS.

CHAPTER III.

TYPE IN BREEDING, AND STRAINS OF LIGHT BRAHMAS.

IN setting up your boys in the business of practical poultry keeping, or for breeding thoroughbreds for the market, it is well that they have a motive and aim in view,—something that will interest and instruct them as well as help them to make money. We will therefore give a rule to secure uniform type and color in breeding, or how to establish a strain of such blood, hoping by interesting them in the theory to interest them in the practical workings of it.

The American people are lovers of “beauty” in everything; a beautiful horse, a beautiful cow, all demand a price far above those of equal merit that fail in symmetry. Then in breeding aim to attain: first, beauty or symmetry; second, color; and both coupled with merit as egg producers; and as the first two are to be transmitted in a greater degree by the male, it becomes of great importance that he should possess those desirable features.

In selecting a sire be sure that he is *well-bred* and comes from a *line* of “*good ones*,” a bird which is the counterpart of *his* sire, for then you have a double guarantee that he will control the offspring. As a rule, the offspring bred back to the grandsire—the sire and grandsire being alike—we start with almost a certainty

of success, if we do our part in the mating. Having made our selection, we must put our foot down and stand firmly to the rule of breeding to no sires but this one, or males of his get, and none of them that do not assume the likeness of the sire, thus establishing a line, or "strain of blood," which, in a single word, means uniformity.

In the hen secure first, productiveness as to eggs; second, a robust constitution, coming from a long-lived race; third, color; lastly, symmetry; and from this mating select the large pullets that most resemble the sire, and breed them back to the sire. This second crop of birds will be three-fourths the blood of the sire you selected as the founder of your strain.

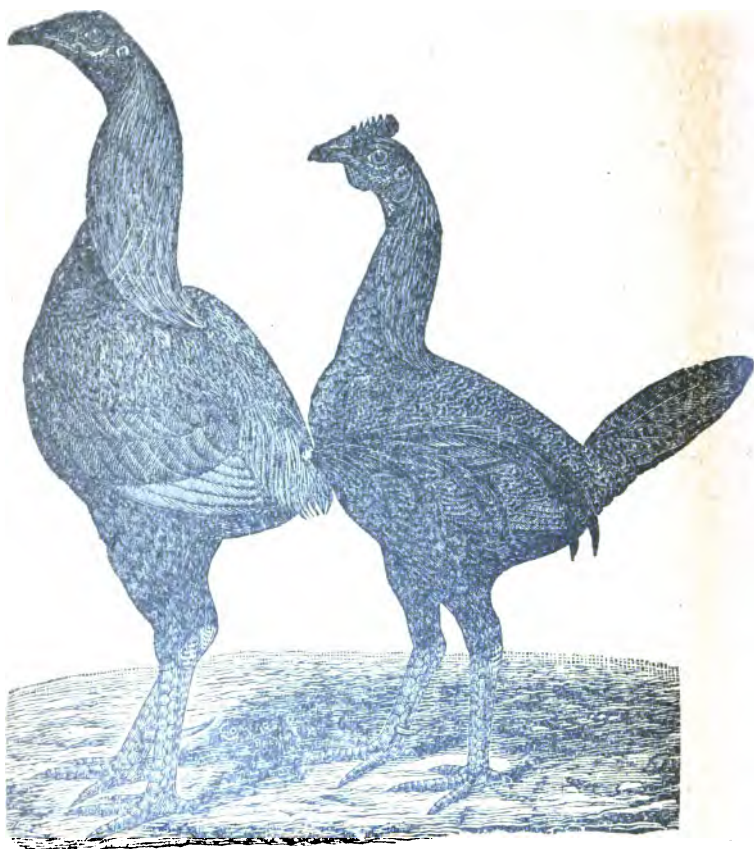
Now the more stubbornly the blood of the first dam gives up to the blood of the sire, the more good it will do us when subjected properly to him.

Many select well bred hens of a weakly constitution to make the first cross, for they assert, and truthfully, that the sire, being so robust and strong, nearly all the chicks favor the sire. This is all true, but it is also true that the blood used in the hen is weak and will fail in lasting quality. We like strong blood; that which in the first cross seems to fight for the breeding influence; that which has got to be bred back to the strain desired, and the control given if only by a preponderance of blood. We then get a lasting good from the cross. Constitution and vital force must come from the dam, form and color from the sire; and in all the matings the introduction of new blood must be with a thought to that end.

The crossing of two well bred strains oftentimes pro-

BUFF COCHINS.





BLACK-BREASTED RED GAMES.

duces a distinct and new type which is very beautiful. To secure this new type (which is in itself a fact that the two elements producing were of equal strength, as neither controlled the breeding), and to perpetuate it, it would in that case be wise to select a dam of delicate though pure blood, thus giving the sire all the chance possible to stamp his offspring; then by breeding his pullet back, to concentrate his breeding in his grandchildren, they also being his children; then we could go on, by selections of coarser or stronger dams for new blood for the strain. The American breeder is of a restless nature; he wants something that is peculiar to himself, something in which he can be identified. You find them all over the country chopping up the blood of their birds by the introduction of new sires, first from one flock, then from another, hoping thereby to have something different. They succeed; but when they have got it they are disappointed that no one else wants it. They think the bottom has gone out of the chicken business, and they curse the business and retire. Of such we will say, the business is better off when they do retire. Now there is but one way to reach uniformity in breeding, no matter whether it is horses, cattle or fowls, and that is by "in-breeding," and like poison, it may kill or cure, just according as we display good judgment in its use.

Whenever we introduce new dams to a strain, breed their progeny back to the sire of the strain, and never use sires from this new introduction of blood until the blood has become thoroughly subjected to the strain.

To explain: If the chicks of the mating of the pullets to sires of the strain are not all in type like the

strain, then breed back again, and do not use a male as a stock bird until the desired affinity of the blood has been accomplished. As a rule, use no male with less than seven-eighths of the blood of the strain, nor females with less than three-fourths of the blood of your strain as stock birds.

If all the breeders would adopt this plan of breeding, and would keep a record, they would then see the importance of pedigree, and how beautifully all these things are governed by a natural law. We can mix the blood of our birds as easily as we mix the paints that give us different tints in color. By adhering to this mode one breeder becomes of benefit to his neighbor breeder, for by crossing strains the pullets become of equal value to each; each breeding back to his respective strain makes the blood of his neighbors' strain feed the blood of his own. When breeders learn this, and work together, they will all be better off, and may become founders of families in fowls, as now breeders of Shorthorns become in cattle. We will follow out this subject by considering

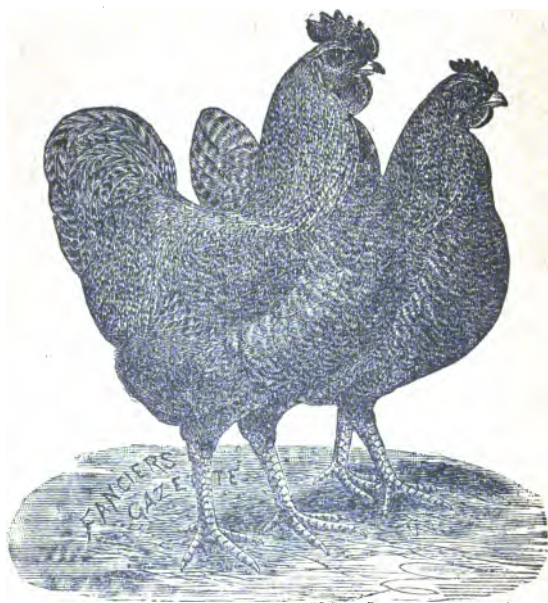
THE STRAINS OF LIGHT BRAHMAS.

We speak of fowls as being of such and such a person's strain, but with no significance in the sense of individuality. Fowls cannot be said to be of a strain unless it can be shown by history or pedigree of blood that they possess fifty per cent or more of the blood of the strain. A type that reproduces itself is simply the result of an established strain.

It is proper to speak of Williams', Gilman's, Buzzell's, Dibble's or Bacon's stock, but to speak of strains



HOUDANS.



PLYMOUTH ROCKS.

of blood in this connection is all wrong, for there does not exist, nor has there ever been more than four strains of Brahma blood brought to the country, and we have to number the birds Mr. Burnham calls Grey Shanghais, to reach even that number.

If A purchase a cock of B, and the second year purchase one of C, to follow it upon his flock, the chicks cannot be called A's strain; nor can it be called A's stock, only in the sense of ownership, for the blood is one-half C's, one-fourth B's, and only one-fourth the original blood of A's stock, C's stock being the more proper name, since it has twice as much blood of that strain as either of the others.

The word strain implies, in breeding, a strict adherence to the blood of a particular family or importation, admitting no more foreign blood than is necessary to sustain the health and vigor of the race.

In this chapter it is our purpose to show what strains have been received and to what extent they have been retained, showing as far as possible what the principal Light Brahmas of the country are made up of; for the time has come when information showing that a recorded history of blood and breeding of both sire and dam is needed.

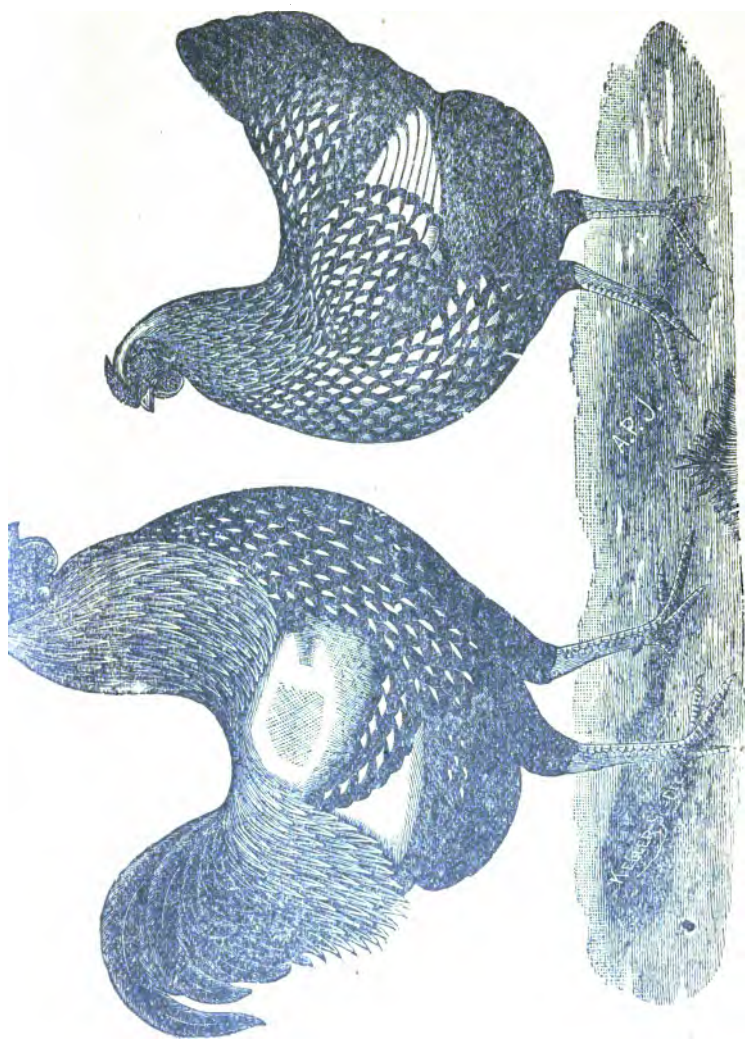
One may have females of one strain and purchase a male of another, and by in-breeding secure both in their purity, for there is a constant waste going on in the blood, which must be replaced; and we think it can be demonstrated that more than one-eighth of foreign blood has to be introduced before the original suffers any organic change, and that this one-eighth is consumed by the original in supplying this waste

spoken of. To illustrate our position, we will mate the strains as we would a pair of chicks of one strain, and show that the same rule of in-breeding applies to them as to the fowls of an established strain. We mate a Felch sire to an Autocrat hen; the first season the progeny is one-half Autocrat and one-half Felch. In the second year we mate these pullets to this same sire, No. 1 Felch, and produce chicks that are three-fourths Felch and one-fourth Autocrat. We also mate a cockerel of the first cross to the Autocrat dam, and produce progeny three-fourths Autocrat. The third year we mate the three-fourths Felch pullets again to the original sire, and we produce seven-eighths Felch birds, while again mating a three-fourths Autocrat cockerel to the original dam, we produce a progeny seven-eighths Autocrat. We have now produced the two strains from a single pair, and we claim them to be in their purity, for the blood of each has been gradually reduced in each family until entirely consumed. Beyond the point named it will not do to go, as further in-breeding would result in sterility; yet we can take birds from each of these families of the third year's breeding and repeat the same process "ad libitum."

We can vouch for this experiment up to this point of seven-eighths. It is on this principle that we have the pure Duchess and pure Princess cattle; and although we may say a cow is one one-hundred-and-twenty-eighth Old Favorite, yet is purely the blood of Old Favorite of Shorthorn fame, we are consistent, for this infusion of one-eighth new blood but supplies the waste in the original; consequently nothing is added, and the blood remains pure.



BROWN LEGHORNS.



WYANDOTTES.

Among horsemen the rule generally followed is to breed out, as they term it, once, and breed in twice, by which process they reach only the three-fourths rule, which is hardly enough to secure against loss of type and color in poultry; for we have demonstrated that one-eighth is the amount actually consumed, and if we do not breed in to that extent our flock gradually changes in type and color. If with a strain once established we make a cross, and breed back to sires of the strain having out-crosses other than the ones we have described above, we can breed in so far as to produce chicks sixty-one sixty-fourths of the blood of the original strain. Males of such production are valuable, but the females are generally poor layers and poor breeders, producing small, tough-shelled eggs, which seldom hatch.

The matings that produce birds three-fourths and seven-eighths the blood of the original strain (this being the prolific stage of in-breeding) have the most merit as egg-producers and show-birds. Pride in one's strain, and a desire to keep up the prepotency in the male line, should be the only inducement to breed beyond the seven-eighths cross.

To do this work of breeding, and the more easily to control it, a record or pedigree should be kept by every breeder; and all males and pens of females used as breeders be named, if for no other reason than to give them an individuality, and to fix them in memory.

All breeders should keep a pedigree-book. The time has come which compels us to do so for self-protection, for the prominent strains are becoming more or less intermingled. The Standard by its influence

is converting the different strains into one common type and color. Since there is no outward indication of difference of blood, one can see how essential a pedigree is, so that in mating we may be sure of a cross when we purchase a sire or dam. One hardly wishes to send one thousand miles for specimens to put into his flock and find them identical in blood with his own.

The cattle-breeder, in purchasing a bull to stand at the head of his herd, looks up his pedigree, and by that pedigree is enabled to select one that is bred in line with his own stock, yet with a cross of blood that will by its introduction improve his herd and be consumed by it, without changing in any way the individuality of the strain of blood he takes pride in breeding.

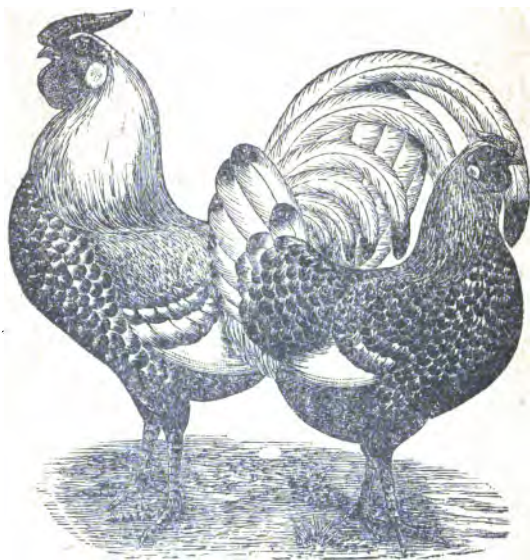
This introduction of new blood is but the feeding of the strain, and it is of as vital importance to know that we feed the blood as to know what we feed in the manger to support the life of the organism.

A truthful record or pedigree would crush out the existing jealousies and restore harmony, for it compels breeders to stand or fall upon their own merits, and makes the blood and the specimen of a strain worth as much in one man's hands as in another's, as we now see demonstrated in Shorthorn cattle.

None can fail to see what a benefit it would be if a printed record or history of all the Light Brahmas now bred in the States could be made as a basis—a foundation-blood from which to obtain a pedigree, or to use in mating, and what an influence it would have on the same by bringing such strains and sub-strains into notice, and as a result furnish a ready market.



COLORED DORKINGS



SILVER-SPANGLED HAMBURGS.

The real strains being once established, and the situation understood, the breeder would be relieved of the annoyance of having inferior stock palmed off as his strain by irresponsible parties, and the blunders in mating made by purchasers would be prevented. The pedigree discloses the breeder, and the assertion that such are Felch, Autocrat or Philadelphia birds, if proved by a pedigree, has a meaning, and protects the honest breeder. We know many are opposed to pedigree, for it prevents the selling of superannuated hens as yearlings, and presents to the amateur too sure a rule for breeding; for the selfish say, "Let the beginners do as we did, and work out the problem for themselves by experience."

In looking over the winning birds for the past ten years it is surprising to see how universally it is true that they are the result of uniting two strains, and breeding back to one of them. As we present the history of the different strains and sub-strains, or flocks composed of two or more strains, with statistics as to their breeding, the rule will be apparent.

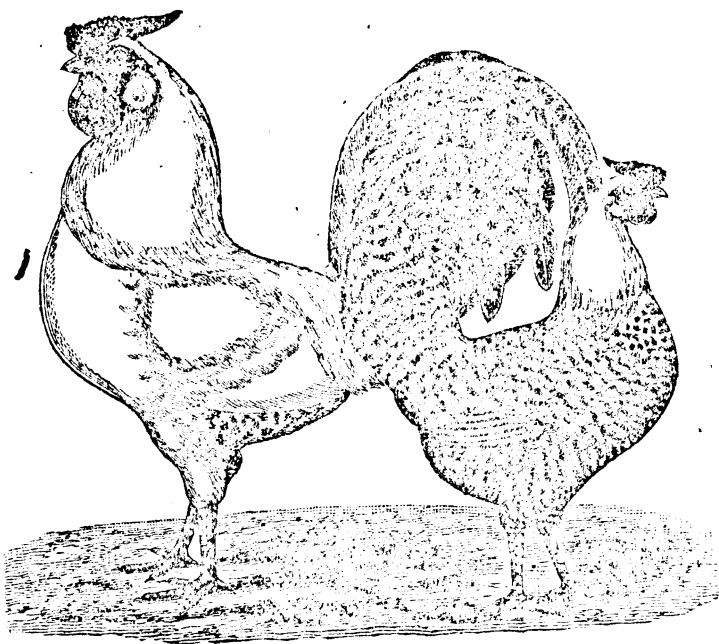
THE BURNHAM STRAIN.

This strain was, as he affirms, and as we understand the matter, the Gray Shanghai of 1849-50. From this blood was produced the fowls presented to the Queen. In 1866 the purest blood of this strain was found in the possession of Mr. Phillips, and was known and handled by Mr. Williams and Mr. Comey as Phillips birds. Mr. Phillips, just before his death, in conversation with Mr. Comey, asserted that his flock was from the birds sent to the Queen by Geo. P. Burnham, that

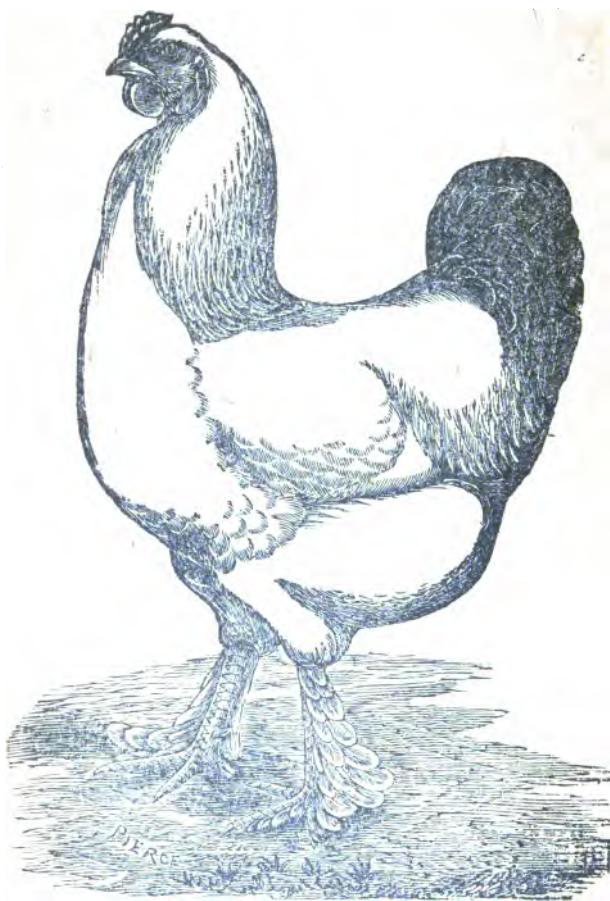
he had bred them as closely as he could, using but one or two top crosses, and breeding back in a general way. He did not preserve the strain by any fixed rule of inbreeding, yet he must have preserved to a large degree the original blood, as his birds, to a large extent, come with single combs. They were dark in blood, preserving the Chittagong characteristic of dark undercolor. The blood of this Chinese strain has been used to a considerable extent by breeders of other strains, as we will show anon. Until 1856 or 1858 these birds were known as Chittagongs, or Single-Combed Brahmas, as was also the Rankin strain.

THE RANKIN STRAIN.

The original birds of this strain were from India. This Mr. Rankin can clearly show. They were large in frame, had low single combs, dark undercolor in back, and large, lemon-colored legs with a prominent greenish-blue vein down the inside. The last feature seems to have followed the crosses of this strain with other strains, and seems to have been transmitted more readily than any other. Up to 1866 this strain or importation was kept pure. About that time the different exhibitions ceasing to give prizes to Single-Combed Brahmas, Mr. Rankin was compelled to use top crosses of pea-combed sires from the Chamberlin strain, and other sub or mixed strains, to secure the engraftment of the pea-comb on his strain; and as breeding back so as to retain the pea-comb would be too discouraging a process to accomplish his purpose, it is more than probable that the race hardly held its own as a strain,



SILVER-PENCILED HAMBURGS.



LIGHT BRAHMA COCK.

for it would be obliged to retain fully fifty per cent of the original blood to be called a strain now.

These birds, however, have been largely used by the breeders of other strains, for Mr. Rankin shipped large numbers of them to Connecticut, and to and about Philadelphia, which, with the Dr. Kerr birds, have largely entered into, and, being subject to top crosses of the Chamberlin strain, have become the origin and foundation-blood of the Philadelphia (Tees) strain.

THE PHILADELPHIA STRAIN.

The Philadelphia strain was known as Kensington or Tees stock about 1867 and 1868. While these birds can hardly be called a distinct strain, yet as such they have been used, in connection with those of the Rankin strain, by the breeders of the Autocrat and Chamberlin strains, and the crosses have proved of the very best, and as auxiliaries deserve a notice in this connection.

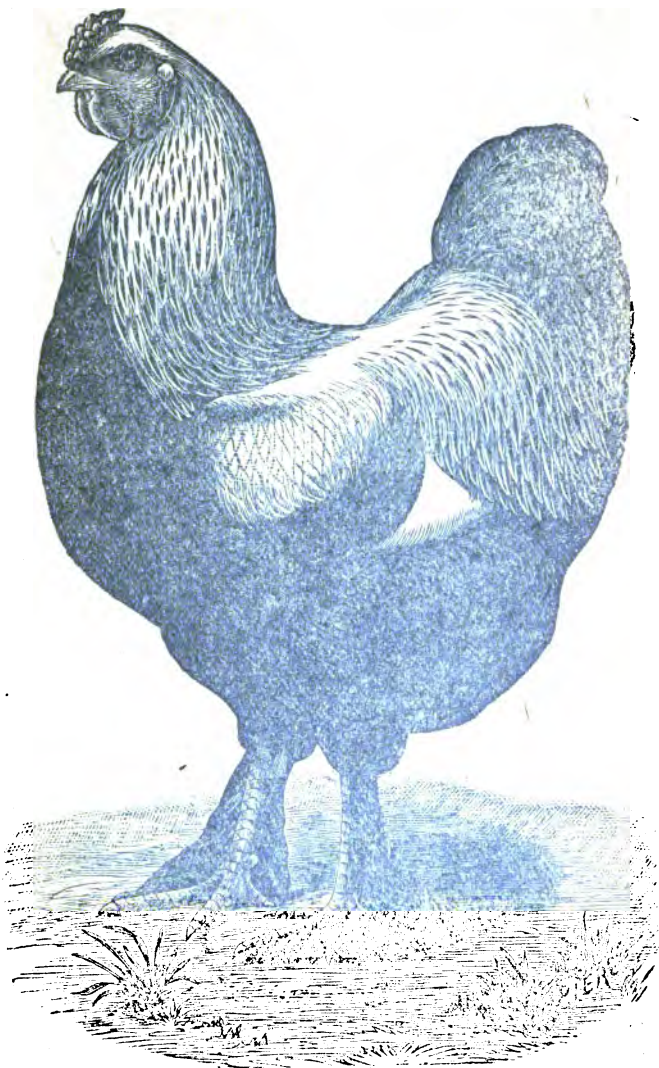
This sub-strain (so to speak) which comprised the Brahmas in and about Philadelphia in 1866, were the winners in the Philadelphia and the New York exhibitions in that year, and were called the "Tees" birds. In conversation with Messrs. Henry, Tees, Sharpless and Herstine, we learned that the foundation-blood was originally from India and the Dr. Kerr birds which were from China. Whether they made allusion to the birds sent to Philadelphia by Mr. Rankin or to birds direct from Chittagong we cannot say, and it makes but little difference, for, as they affirmed, they were single-combed as a rule, and large of frame, with pale yellow legs.

From 1863 to 1868 these birds were converted into pea-combed stock by top crosses of birds from Connecticut and New York, which were probably from the Chamberlin strain or birds of like origin. At least we know this to be true in the case of the bird known as the fourth-prize cock of New York, in 1868, at the rink, he being from a cockerel bred by Mr. Pool, of New York, and out of hens by Baron Sanborn 302, bred by I. K. Felch.

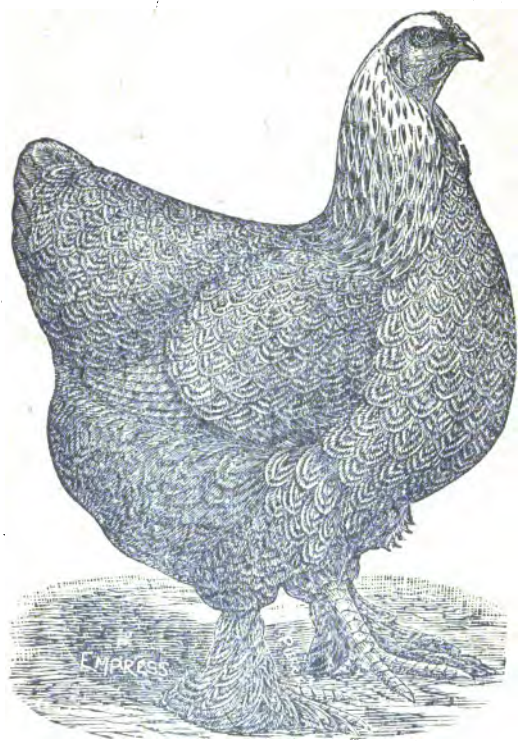
We have spoken of the peculiar color and vein in the leg of the Rankin strain, and the power with which the race transmitted it.

The fact that this feature, though in a milder degree, was apparent in the crosses of the Philadelphia birds with those of the Felch, also with the crosses of the Autocrat strain, seems to indicate that the Rankin or similar blood entered largely into the foundation-blood of the Philadelphia birds of that period, as the parties we have alluded to affirm. Again, the birds brought from Philadelphia in 1868 and 1869 had the color of the Chamberlin leg, yet they still retained the Rankin shape of bone, being more round in its formation than that of the Chamberlin stock. It will be seen that all the birds purchased of Mr. Williams from his so-called "Favorite Stock" did not materially alter the blood, for they were but the result of mingling the blood of the Rankin, Burnham (the Phillips Stock), and the Chamberlin strains, which is like the blood of the Philadelphia strains, for Burnham's and the Dr. Kerr birds they affirm were alike and from China.

These birds were quite short in the back as compared to the Autocrat or Chamberlin strains.



DARK BRAHMA COCK.



DARK BRAHMA HEN.

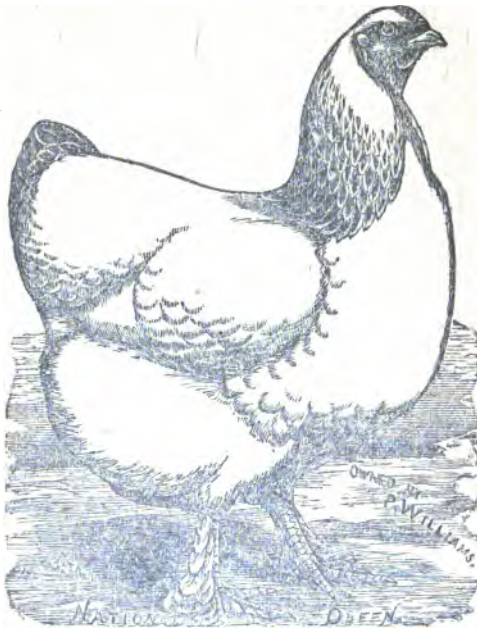
One fact worthy of note here is, that the old hen exhibited by Charles Tees in 1867, then eleven years old, was as fine a Light Brahma hen in color and size as has been shown since, and her beautiful pea-comb shows that there were pea-combs and bluish under-colored specimens bred in 1856. She weighed fourteen pounds and four ounces, a larger weight for a Brahma hen than has since been bred, thirteen pounds and fifteen ounces, and fourteen pounds being the best weight for a Felch bird, and fourteen pounds, and two ounces the largest Autocrat hen on record. The writer fails to see that the Almighty has suffered man to increase the size beyond that of the original.

There were several breeders of these Philadelphia birds of 1868, and if they have kept a record of the top crosses used since that time that have been of a different strain, it will be of much interest to others; for, as breeders, we are compelled to breed to that form and color defined in the Standard of Excellence, and our strains constantly needing blood-food, it makes it necessary that the blood of each strain be different, and thereby does it become more valuable.

All the strains are dependent one upon the other for this blood-food, and not only is it a personal interest to preserve these distinct types of blood, but it becomes a general necessity, for a strain that is isolated soon runs out; the loss of color and vitality soon works its own ruin.

The top cross of Beauty Duke upon the Philadelphia birds, as Mr. Wade and the writer understands the matter, was simply adding a new top cross to the amount of one-fourth the blood of the Chamberlin

derived from the cross of the fourth-prize cock of New York, 1868, with Felch hens. But if, as it has been claimed, he was the progeny of a son of Duke of York and a Philadelphia hen, upon a Felch and Philadelphia hen, then he carried into his Philadelphia harem one-eighth the blood of Old Autocrat and one-eighth Chamberlin blood, as a top cross upon the Philadelphia birds of 1868.



LIGHT BRAHMA HEN.

THE AUTOCRAT STRAIN.

The history of this bird, Autocrat, is well known. Mr. Estes purchased the bird in Fulton Market, New

York, the seller avowing that he was imported. The subsequent history of this bird, his strong breeding qualities, the fact that when the blood was crossed with other strains it produced new types, this, with the pearl eye so different from the prevailing bay eye in other Brahmas, to our mind presents grounds for believing the assertion that he was imported, although there is no proof to that effect.

This bird was bred one season to females whose foundation-blood was the George P. Burnham birds, being the progeny of the stock sent to the Queen by that gentleman, the birds being "Phillips Stock," so called by Mr. Williams, who sent them to Mr. Estes. In 1866 Mr. Estes presented Autocrat to Mr. Williams, who bred him to the best birds he could procure from several sources.

The better to understand the advantages received by the breeders of Light Brahmas through the advent of "Old Autocrat" it is necessary to say that before the war Mr. Williams' stock of Light Brahmas consisted of the Chamberlin blood, through purchases of them at Valley Falls, the Burnham blood and the blood of the Rankin importation. When Mr. Williams returned from the war, his old love clinging to him, he commenced again by purchasing the best stock he could procure in his locality, the same being descendants from stock he bred before going south; also birds of Mr. Strout, of Framingham, that were from a cock purchased in Abington, mated to a Felch hen by a son of Baron Sanborn 302; also, hens of H. G. White, which were pure Felch, by Baron Sanborn 302. Birds bred from these elements were the foundation-blood in

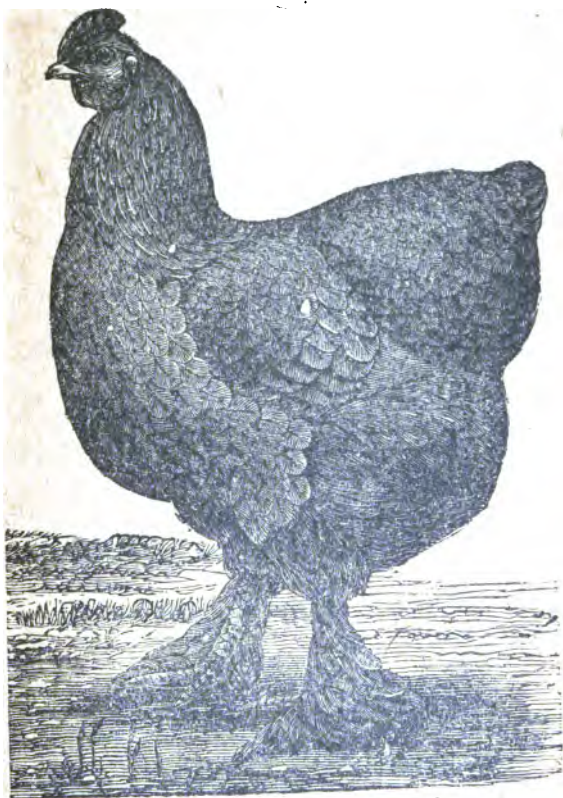
Mr. Williams' yards, and out of which came his "Favorite Stock," and the same were in his possession when Old Autocrat appeared on the stage. Autocrat was mated to the best birds to be found in all these elements, and the male produce was Autocrat 3d, Eaton's Autocrat, Lord Berkeley and two other sons.

Old Autocrat died early in the season. Lord Berkeley was a dark-plumaged bird, and as he bred very dark he was sold to go west.

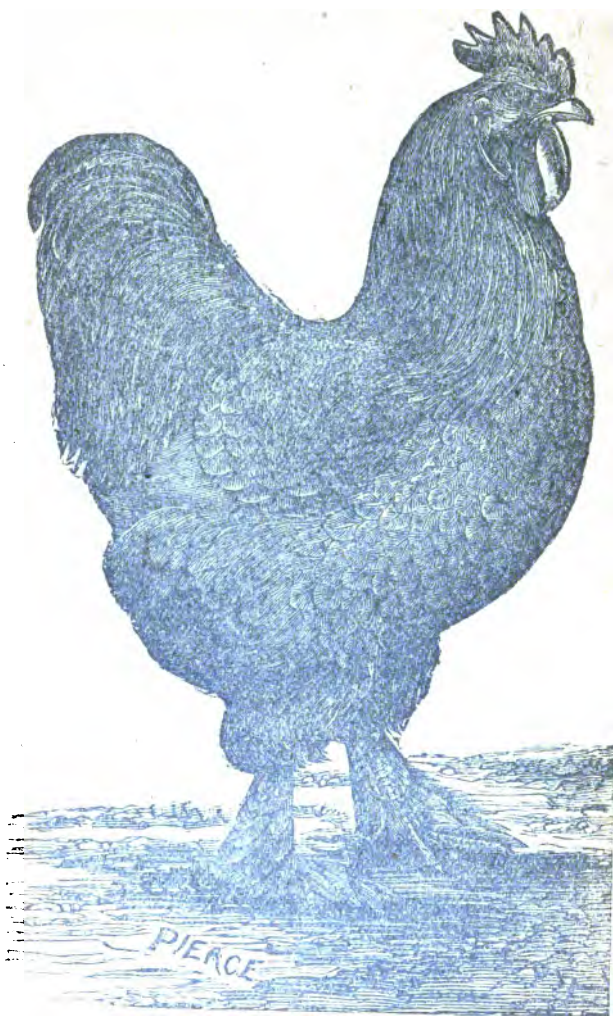
Autocrat 3d was a very large bird, but did not prove a good sire, many of his chicks coming single-combed. The greenish-blue vein was prominent in the leg, which strongly indicated a Rankin cross in his dam. He was lost by sickness, and his place filled by Eaton's Autocrat, who proved a good sire, but the plumage of his chicks was dark. In all these Autocrat crosses the dark undercolor prevailed.

One of the other sons was sent to Mr. Estes, of North Carolina, where he was bred to birds of the year previous, out of the Phillips birds by Old Autocrat, producing the birds Colossus, Apollo and Triumph, all of which were purchased by Mr. Williams. That the blood of old Autocrat was radically different from other established strains is apparent in the fact that whenever crosses were made with it they proved good, showing increased size and producing new types, which had equal strength in breeding with other established strains.

The friends of the old bird express a regret that he could not have lived, and his progeny bred back to him, thinking that the results would have been astonishing, and they consider his death a misfortune.



BUFF COCHON PULLET.



EUFF COCHIN COCK.

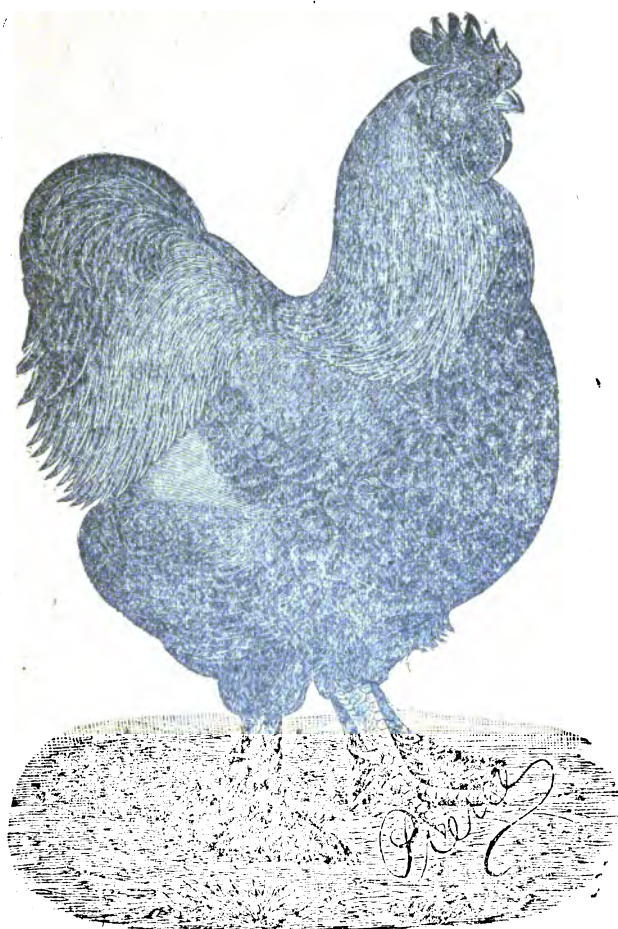
Now we do not concur in this opinion, although friendly to Old Autocrat, for his progeny bred too dark. It may be said that this fault of the progeny was derived from the Phillips hens. To this we cannot assent, for to admit this is to concede the merit of breeding to the Phillips stock, and to admit that Old Autocrat was weak in breeding qualities, and as all breeding tends to grow lighter it is this very dark breeding that has made his blood so valuable to breeders of other strains. The whole rank of breeding within two years will hail the advent of another such bird with joy. To prove that this dark blood and breeding is the work of Old Autocrat we will say that all the crosses of the old bird with the Felch stock resulted in dark-plumage birds. The progeny of Autocrat 3d, whose breeding indicated so strongly the Rankin descent, bred even darker than the others; the cross of Son of Colossus with the Felch hen Penelope was also dark. A son of Duke of York out of a Tees hen, even-mated to Felch hen, bred dark; yet the Rankin blood bred to Felch did not breed dark, nor did the Tees hen bred to Natick, the Felch cock, prove dark. We could cite other cases of like breeding, all of which goes to prove Old Autocrat to have been dark in blood, and in our judgment, had he lived to have been bred to his own progeny, they would have been so dark that he and his descendants would have been abandoned. As it is, he and his blood have proved a blessing, and where breeders of other strains have had the patience to wait and breed back have been very much appreciated. The fact that the hens he was bred to in Mr. Williams' hands were of a mixed strain of blood made his prog-

eny of far more value, for it gave the power of breeding more readily to his influence, and they being thus made up, gave the preponderance of blood to Old Autocrat, which with this great strength of breeding which we have shown entitles the blood to the name of a "strain." One thing is certain, his blood has been the only competitor the Chamberlin-Felch strain has ever had, and surely the Felch and the Autocrat birds have done more to make the interest in light Brahmas what it is in America than all other causes combined.

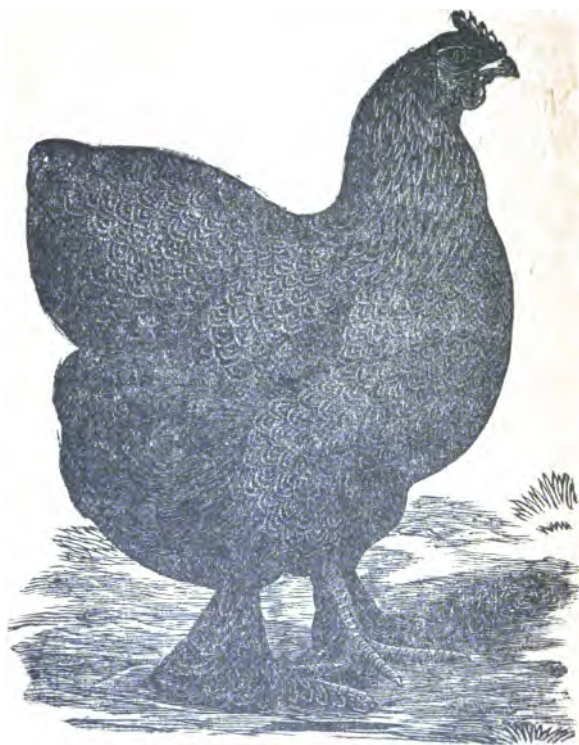
So thoroughly has Mr. Williams become identified with this strain that to a great extent it is quoted as Williams stock. But there are others in a like manner quoted, which makes it fair to state that Mr. Comey, of Quincy, Mass., as well as Mr. Williams, its principal, is breeding the Autocrat strain, fed by the blood of the Felch and the Philadelphia strains, and that of other sub-strains, to maintain its vitality.

DUKE OF YORK.

Mr. Comey's Duke of York was a grandson of Old Autocrat in a double sense, for both his sire and dam were the progeny of Old Autocrat out of the Phillips hens, bred by Mr. Estes. The Phillips hens, as we have described above, were in foundation-blood the same as the stock sent to the Queen by Mr. Burnham. The Duke of York was a vigorous bird, and lived to be bred to his own progeny, and also to the Philadelphia hens purchased of Chas. Tees by Mr. Comey, and to this mating we believe should be given the credit of bringing out in its best form the breeding qualities of the Duke, for sons by the Duke out of his daughter, mated



PARTRIDGE-COCHIN COCK.



PARTRIDGE-COCHIN PULLET.

with the pullets by him out of the Philadelphia hens, proved excellent birds; but the first cross with the Philadelphia hen developed poor combs, as did the Philadelphia stock with the Felch hens.

It may be asked by the friends of Philadelphia stock where the progeny of Colossus got their faulty combs. We will say, just where the Tees stock got them,—from the Rankin. The blood was there, and large birds could not be forced without its development.

Mr. Comey made crosses of the Rankin strain, which, as he informs us, he abandoned, as it with the York blood developed nothing desirable but size. Since 1869 Mr. Comey has confined himself principally to different Autocrat crosses, as can be seen in the Duke of Norfolk, Duke of Springfield, etc., descendants of Colossus, Apollo, and Triumph. He has adhered more closely to in-breeding than most other friends of the strain.

In closing our remarks upon the blood of Autocrat we will say that, so far as they allude to Mr. Williams, they were submitted to him, and after examination by that gentleman we received the following:

MR. FELCH:

I have your manuscript, and have carefully read it. I cannot see that you have made any mistakes or said anything that is not true; neither could I add anything that would make the history more complete. Wishing you success, I am,

Yours truly,

P. WILLIAMS.

THE CHAMBERLIN STRAIN, NOW SO WIDELY KNOWN
AS THE "FELCH STRAIN."

This strain is well known as coming from the birds that were found by Mr. Knox in the India ship in New York city in 1847. The first to breed these birds were Mr. Chamberlin and Mr. Cornish, of Connecticut, and Mr. Smith and Mr. Childs, of Rhode Island, the last-named individual winning the Albany and Barnum exhibitions of New York. The strain was in but very few hands up to 1852, at which time at Boston it created the sensation which gave to the breed an identity and a name. For several years it went by the name of Brahmas or Short-Legged Chittagongs, the breeders clinging to the then good reputation of the Chittagong. But from 1857 to 1865 we see the Chittagong conceding the palm to the Brahma, by returning the compliment and being exhibited as Single-Combed Brahmas; and finally, in 1865 we find them discarded altogether as a race—the edict that all Brahmas should have a pea-comb sending them into oblivion.

This Chamberlin strain from its advent has bred, as a rule, pea-combs and orange-yellow legs. The early specimens being creamy white, and the prevailing undercolor bluish-white, it has been a struggle to keep this bluish undercolor, for all strains grow lighter, and at the present writing, with all the care to retain it, one-half of the specimens will come white in undercolor. To secure fine neck-hackles and dark tails and wings, this bluish-white undercolor is absolutely necessary; and in introducing new blood into a strain one can see how important it is that a dark specimen be chosen.

FELCH PEDIGREE STRAIN.

From the original birds bred by Mr. Chamberlin came the cock Imperial 300 (the male that has been facetiously mentioned as the bird Mr. Felch bought for a dollar or two out of a hen-cart), the founder of the well-known Felch strain of Light Brahmas. The female to which Imperial 300 was mated came from eggs bought from Mr. Childs (alluded to above), and were from Virgil Cornish, being in blood the same, and the name of Chamberlin strain would be far more appropriate as indicative of its origin; but as the breeding world has seen fit in its generosity to know the strain by the name of the writer of this work, he can only accept the situation.

The writer is well aware that but for his love for the breed during the lull in the chicken fancy, from 1855 to 1864, when nearly all the fanciers allowed their fowls to run out, so to speak, and accidental good luck in the way of an egg laid by Old Princess, out of which Honest Abe 307 was hatched, he too would have lost his interest, and with it would have been lost the pedigree and proof of blood that has preserved the identity of the strain.

The writer would prefer that the strain should be known by the name of its original founder rather than to have it as it is, for he is now made responsible for the breeding of the strain, it matters not who mates them nor how far they are removed from his breeding, for then he could stand or fall on his own merits as a breeder, and his reputation would only be affected by the specimens bred by him and sold by himself. In speaking of the management of the strain, we will do so in the first person, submitting the following:

Since the purchase of Imperial 300 and the egg out of which I produced the hen Lady Childs, I have kept a true record of blood and breeding of all the families of the strain. This discloses all the introductions of new blood, and from what source it has come. These introductions of new blood have been made on the principle that all animal life is suffering a continual waste, and is in as constant need of blood-food in a reproductive sense as it is of daily food to supply the waste in the individual, and experience teaches that no strain can be sustained without this supply.

The blood used to vitalize the strain in my hands has been: First the blood in the old Nanturier hen, as seen in the use of Duchess, in 1858, being used as stock in my pedigree fowls in the hen Princess 362, which was one-eighth Nanturier blood. The next cross was Lady Mills 364, she being three-fourths Chamberlin and one-fourth Burnham blood, her one-fourth foreign blood being derived from the then so-called Chittagong or Gray Shanghai, from the Burnham Queen strain. Since 1865 all new blood has been drawn from the Autocrat strain, as seen in the following birds (see my pedigrees in the World's Pedigree Book):

Autocrat Belle 392, Eaton Belle 407, Lady Ipswich 1022, and Maud Williams 4146, and the cocks Experiment 337 and Ned Williams 4145, a brother to Duke of Springfield. The crosses from the Philadelphia birds being Chicago Belle 382, Mrs. Strout 404 and the cockerel fourth-prize cock of New York, 1868.

By the tracing of these pedigrees it will be seen just how much blood other than the Chamberlin (the orig-



LIGHT BRAHMAS.



WHITE COCHINS.

inal blood) is now represented in the Felch birds, or strain now bred by me. I will speak of some of the characteristics developed by these crosses.

While it was asserted at the 1852 Exhibition at Boston *that this was* a breed that would never run out, and although there has never been a breed so severely in-bred, yet all this introduction of blood was necessary to preserve the original type and color, for if continually in-bred a loss of constitution, a change of type, and a reversion to white in color would have followed, while the third in-breeding of new blood to a strain will invariably result in fine specimens.

In the early crosses of Autocrat blood with the Felch the progeny was invariably too dark in plumage, and although oftentimes developing new types, the first in-breeding would restore three-fourths of the progeny, while a portion of the males would revert to light color, as in the case of Moses 327. The third in-breeding to the strain was necessary to a full restoration to the Felch type and color. (For my reason for that, see notes in history of Old Autocrat.)

The cross of Experiment 347 (Autocrat) with Columbia 386 (Felch) produced chicks of the same character, which took two in-breedings to restore.

The cross of Son of Colossus (Autocrat) to Penelope 1019 (Felch) presented the same feature, but the third in-breeding to the strain produced birds scaling 92 to 94 points, and many won first prizes. I think that had Old Autocrat lived to have been bred to his own progeny, his blood, so highly prized by breeders of other strains as new blood, would have been discarded. As it is, I presume Mr. Williams and myself have often-

times been censured, or at least the stock has been, for this very virtue—strength of breeding—by those striving to cross the strains, and many a good bird abandoned, which, had it been bred back to either strain, would have developed fine stock.

The tendency to breed dark when the Autocrat and Felch crosses are made still exists. The cross of Phi Beta 5876, with Juno III 5879, produces a fine lot of females, but males too dark in some cases. These pullets known as Juanetta 5994, mated to the Felch cock Daniel Webster II 5999, continued to breed dark enough to produce fully eight per cent of the chicks with slate-colored backs. These birds are generally males, and grow up to have fine hackles, wings and tails, with quite dark undercolor to backs, and when they prove females they are, as a rule, too dark for exhibition purposes. While this is on the dark extreme, it is better than to have all hatch absolutely white, for then there is more or less loss for want of color in neck, wings and tail. One such cross is, however, worth three times a cross that resulted in all chicks hatching pure white.

The believers in dark undercolor, with myself, would approve, while those so strenuous in their belief in the white undercolor of back in breeding stock would condemn.

The early crosses of the Philadelphia birds with the Felch invariably produced lopped combs, and many that maintained their upright position had the middle division much too high. This and the development of the greenish-blue vein on the leg show clearly the India cross in the blood of the Philadelphia birds.

The color was easily controlled, and although there was seemingly no difference in the size, yet the progeny were much larger in the first cross, and were longer in arriving at maturity. Chicago Belle 382 weighed twelve pounds at twelve months old. This cross, as developed in Prince 321 by Honest Abe 307, proved a very desirable one, as can be proved by H. S. Ball, T. L. Sturtevant, and Mark Pitman, all of whom used him in breeding. Again Tees Duke (Philadelphia blood) bred to Lady Fay (Felch) by a son of Honest Abe 307 produced the sire and dam of the two hens known as Sturtevant hens, each weighing thirteen and one-fourth pounds, which were never exhibited without winning a prize. Their sire and dam were not large, as Mr. Strout, of Framingham, Mass., their breeder, can testify.

The fourth-prize cock of New York for 1868 was one-half Philadelphia, one-fourth Felch, and one-fourth the blood of fowls bred by Mr. Pool, of New York. This cock bred to Felch pullets, daughters of Honest Abe 307 produced Lady Rice 405, out of which, by a son of Honest Abe 307 (Optimus 315) was bred Cœur de Leon 326, one of the best Light Brahma cocks ever bred in America, and the sire of many prize chicks, among which was Poqonnuck 999, Ben Lidi 2777, Cœur de Leon VI, Leo 2776, and others, selling from \$25 to \$100 each, producing \$1,425 worth of chicks in a single season. All these crosses of Philadelphia blood were controlled in color, which leads me to consider the top crosses of the Philadelphia birds to be Chamberlin blood, or that of a kindred nature. I speak of these crosses to show how dependent the breeder of one strain is upon those breeding another, and that whenever new blood is

taken into any strain of well-bred birds, when it is reduced by in-breeding to that quantity which will soon be consumed by the strain, the best results are reached. This constant feeding of the blood is necessary, and without it no strain can long survive. By one systematic rule we can keep repeating results year after year.

Science tells us that we are changing constantly; the waste in our blood is renewed by new blood, yet the blood in breeding type is the same. So is it with strains. The new blood by in-breeding becomes the weaker and the prey of the original blood that consumes it, constantly invigorating the original and not changing it in the least in type and color.

The stock known as the "Sturtevant birds" were in the main Felch blood, and after the first year's breeding remained three-fourths Honest Abe blood and one-fourth that of the fourth-prize cock of New York in 1868, the former being Felch, the latter one-half Philadelphia, one-fourth Felch, and one-fourth Pool blood. Cœur de Leon 326 was bred by T. L. Sturtevant, thirteen-sixteenths Felch blood, and as I have said, was one of the best birds ever bred in America. Mr. Sturtevant did not appreciate him, always supposing his best birds came from a bird which has many times won at the Boston Exhibitions. That Mr. Sturtevant was honest in his belief is apparent in the fact that he loaned Cœur de Leon to H. F. Felch for the season of 1874, with the results previously described.

The cross of the Philadelphia blood with the Felch, as developed in the breeding through Prince 321 and Cœur de Leon 326 in the yard of Thos. L. Sturtevant, and later in the mating of Cœur de Leon 326 with



BLACK JAVAS.

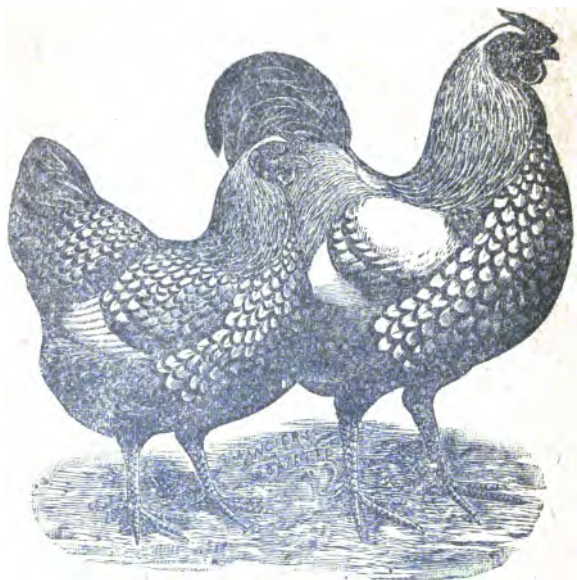


LANGSHANS.

Parepa 395 by **Moses** 327, by H. F. Felch in 1874, was no doubt the best coupling of two strains ever made. Had Mr. Sturtevant's zeal for poultry culture been as lasting as it was fervent at times he would have led the van. But his greater love for his dog and gun, and the pressure of business, have led him to abandon the breeding of poultry for the present.

To review the subject of strains, we come to this fact: that there are but very few strains and very few marked specimens from which originality of type has been established; and when we indulge in top crosses we destroy the strain, unless we resort to in-breeding to secure the benefit of the cross, and to insure the type of the strain.

We find also that all the strains or subdivisions of strains were, in their origin, dark in undercolor, and that with age they grow lighter, and if left to themselves they may lose their original type, change being written on all, and only by persistent effort can these original types be retained. We should feel that as long as we deliver up into other hands these strains as good as we receive them, we have been equal to the task of breeding them, and should be considered breeders; and that if we can improve a breed, surely we deserve praise. I am one of the few that say there are no better specimens exhibited to-day than were exhibited years ago. But I do believe the general average is far better. The excellence of the few is controlled by a fixed law, viz.: The eternal fitness of things, which says, "Thus far canst thou go, O man, and no farther." We are not endowed with the infinite, and our matings are sometimes blunders.



WYANDOTTES.

CHAPTER IV.

DISCUSSION OF MASSACHUSETTS BOARD OF AGRICULTURE AT THE CLOSE OF THE ESSAY ALLUDED TO IN OUR INTRODUCTION.

SECRETARY FLINT: I have been exceedingly interested in the paper which has been read by Mr. Felch. I am sure he has come up to the expectations of those who had so much confidence, when they invited him to prepare this paper. Mr. Felch has had many years of thorough and careful experience and accurate observation, and I am sure the principles which he has enunciated in his paper will be of great interest and great value to the large number of poultry breeders in this state.

I should very much like to hear the experience and observation of those who are now engaged practically, every day, in poultry breeding. There are a great many questions, I know, that many persons wish to hear discussed, and there are others here who can discuss them better than I can. I have been a somewhat extensive poultry breeder in the course of my life. I have kept a great variety of fowls; too great a variety, altogether, I am sure, for profit. I have generally come to the conclusion that where profit, for poultry and eggs together, is concerned, the Light Brahma is the

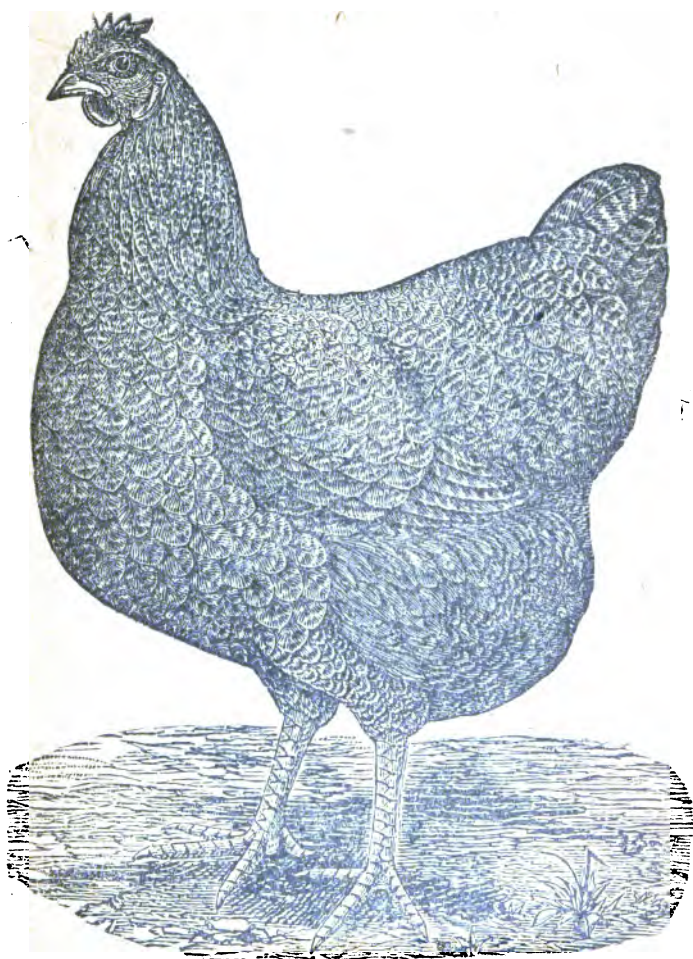
best breed, but as egg producers the White Leghorn, and perhaps one or two other breeds, greatly surpass them.

So far as the feeding of poultry is concerned I am pretty well satisfied that farmers and those who keep poultry are inclined to feed too much corn. Corn, as you all know, will induce fat, and when poultry are to be fattened for market they can be fattened probably quicker and more economically upon corn or cornmeal, heated, than upon any other substance; but as far as my experience has gone, it is not advisable to feed corn if you wish to get the largest number of eggs; it induces too great fat, especially if the hens are kept in some confinement. Hens that are allowed the whole range of the farm may be fed upon almost anything. They run off what little extra fat they get, perhaps, by eating too much corn; but poultry that are confined, or partially confined, ought not to be fed too much upon corn. Oats, or any of the smaller grains, and vegetables, potatoes, fish, and that class of food, it seems to me, are very much better.

As far as the feeding of fresh or cured rowen or young clover is concerned, I have no doubt that what Mr. Felch has said is correct.

QUESTION. Is there any danger of making White Leghorns so fat by feeding them on corn that they cannot fly?

MR. FELCH: I don't think you can give them anything that will fat them so that they cannot run or fly. But as egg producers there is no question that the White Leghorn family is the best. They will forage for themselves, and pretty thoroughly, and they are



PLYMOUTH ROCK PULLET.



stronger in their feet than the Asiatic breeds, if we are to judge by the damage they will do in the garden.

QUESTION. Do you have bottoms to your coops?

MR. FELCH: I do not. I have simply platforms for early spring, on which to place the coops, in the summer allowing them to set upon the ground.

QUESTION. How do you feed the clover rowen?

MR. FELCH: After curing it becomes brittle; simply feed in a rick, as to stock. If it is cut up too fine, and fed carelessly, they will waste it.

QUESTION. Which is the best, the Brown or White Leghorn?

MR. FELCH: I would not say one was better than the other.

QUESTION. Do you have any difficulty in hatching chickens from the eggs that are laid by the Asiatics?

MR. FELCH: That is the danger of the whole business. They sometimes become so very fat that it will be almost impossible to hatch an egg from them. Turn them right out and give them food that will not fat them, and you will find that the eggs will hatch well.

MR. HERSEY, of Hingham: Mr. Felch says that close breeding in-and-in tends to sterility. I would like to inquire if he has had any actual tests of this, and if so, what difficulties he has encountered?

MR. FELCH: What I mean by in-and-in breeding is breeding birds of the same blood or pedigree together. I always take pains when I am breeding in line, "breeding in," as I term it, to so mate that there will be a change of blood, and secure the chick in blood different from sire and dam. It is always better

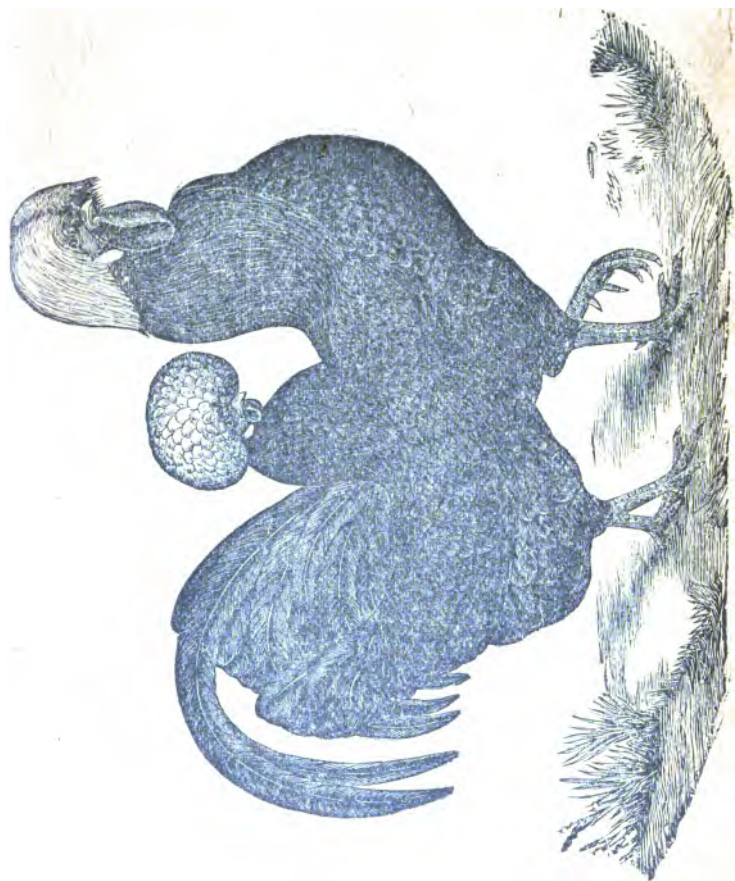
to breed back to the sire than to breed the chicks together. When introducing a new element of blood, I find oftentimes that this works well. This is a rule I have followed for twenty years. I believe I was one of the first to adopt this course. I never buy a male bird, and consequently I have been obliged to make this new blood for scores of others; and when I buy a new bird, I treat it in that way, breeding the pullets of the first cross right back to a sire of that strain, and never use a male bird until I have reduced the foreign blood to one-fourth or one-eighth. Now if you breed in-and-in for three generations, that is, breed brothers and sisters, in three generations, it will be almost impossible to hatch an egg.

MR. HERSEY: Have you had any actual tests of it?

MR. FELCH: Yes sir; I believe, as a rule, the statement I make will hold good. There may be exceptions; there are exceptions to all rules. But I think if any one follows that rule, so that he will know exactly what he is doing, he will find that I am correct. But the fact is, a great many do not know. They will have a flock of birds, and they will save a young cockerel from them and breed from them, thinking they are all of one blood. If they will start from one single dam and breed her chickens together, and their chickens and then a third lot, I am quite sure they will reach a point where the eggs will not hatch. Unless you have a flock of hens in one enclosure you can see how easily you lose track of them. You cannot get uniformity unless you breed your line of sires to the same strain of blood. I think any one who has tried it, will agree with me in what I have said on that subject.



WHITE LEGHORN COCK.



WHITE CRESTED BLACK POLISH.

MR. HERSEY: I suppose we meet together here to gather facts, and whatever the result of our experiments may be, it is for our interest to know about them.

Twenty-five years ago I started for the purpose of demonstrating, one way or another, whether we should be able to breed in-and-in or not. I took a white native, and from that white native I have bred for twenty-five years, and still the eggs hatch. During the twenty-five years only three times have I introduced anything different, and those three times it was done by eggs and eggs only, and the male birds were not kept, only the females. But during the last two years no new blood has been introduced into my flock, and I have bred in-and-in as closely as possible. My poultry yard is so situated, and so fenced in, that no other poultry can come near them. Now the result is that my eggs hatch a great deal better than my neighbors'. Three years ago (which was the last year I had the care of them myself) I set four sittings of thirteen eggs each, and every one of them hatched; and of four others, eleven hatched. I think there was not a single sitting that year that gave less than six chickens from thirteen eggs.

Now I admit that I have been careful in breeding to take only those fowls which were physically strong and perfectly healthy. I think that this is a point to which we must look carefully. I believe that healthy birds will bring healthy offspring. But perhaps I ought not to say what I believe. I only rose to state these facts. It is an isolated case, covering a period of about twenty-five years. If there were twenty-five

other individuals here who could stand up and say that they had tried the same thing, with the same result, we might be able to come to some correct conclusion. Perhaps a single experiment is not sufficient.

Now if other people have tried the experiment of in-and-in breeding, and failed,—if they have really tried it, and not guessed at it,—of course that must count against the experiment which I have made. But I hope that if this Board shall meet in this or any other hall ten years from this time there will be many individuals who will be able to rise up and say, "I know from practical tests what the result is of breeding in-and-in."

MR. FELCH: The gentleman who has just taken his seat says that the introduction of blood was by eggs, saving the females. That does not meet the case, for he put half a dozen new elements into his stock every time he introduced the eggs, which might have helped him out. I do not see that his case touches the point which I advanced, for one introduction of six pullets would have carried him through the whole twenty-five years, and the eggs would have hatched well.

MR. BILL, of Paxton: I have had some experience in keeping hens, but I rise chiefly to add a word to what was said on one point by the gentleman who gave us the very instructive and interesting essay, and that point is this. He spoke of hen-houses in the sides of hills, near our farm buildings, so that the fowls might forage in the pasture with the cattle. Now he did not state what breed of hen would be the best for that purpose, but I judge from my own experience that

a kind of hen not much in favor, perhaps, with most hen fanciers,—I mean the Black Red Game,—is the one best adapted to that purpose.

There is an impression abroad among hen dealers, and those who have not inquired into the matter, that the Black Red Game, or Game hens, are of little value except for their fighting qualities, but with all my keeping of the Games, I never have seen one fight but once, and that was with a White Leghorn, and he got awfully thrashed, so I am not keeping him for that purpose. But I find that in the pastures the Games have the foraging quality, and that is the point I rose to make. I know tolerably well four or five kinds of Game birds, and any of them will walk off and feed by themselves several hundred rods,—almost a quarter of a mile.

Another notion that is prevalent about them is that they are quite wild. That comes partly from the name—*Game*. But I find that the Games are as gentle, if you treat them gently, as any hens I ever had anything to do with. As to their laying qualities, I have kept them several years and I am confident that they do lay well. I would not say that they are as good layers as the White Leghorn or the Brown Leghorn. but I do not know any other family, except the Leghorns, that excels the Game in laying qualities.

Another point about the Game is, that their eggs are from a quarter to a third larger than the Light Brahmas', or than almost any of the pure-blooded hens with which I have had anything to do, except the Leghorn.

I would like to ask a question about the Black

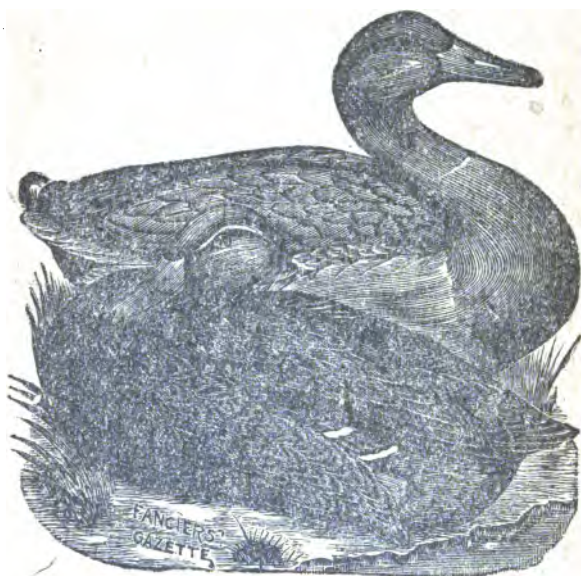
Spanish. What does Mr. Felch know about them, as to their laying qualities, constitution, etc.?

MR. FELCH: The Black Spanish, before the Leghorn came into notice, was considered the best laying fowl. They lay large eggs, but they do not lay a large number of them. I think that a full-bred Black Spanish will lay about one hundred and twenty-eight eggs in a year,—about what our native fowls will do. Probably there is not half a dozen eggs a year difference in what the Black Spanish, the Game and native fowls will lay, and as a rule the Game eggs are much smaller than the Brahma.

QUESTION. How do the Black Spanish stand the cold weather in the winter?

MR. FELCH: Poorly. A Black Spanish chicken is a miserable thing while growing, but when once grown the fowl seems to be quite hardy. It is a beautiful bird to look at—there is no question about that. If a man does not care how much it costs him to produce and keep a flock of Black Spanish birds he can have them and they will do very well, but they are not profitable managed in a practical way. I tried to find the breed that a person with the least experience could do the best with, everything considered, and that is why I selected the Leghorn, Plymouth Rock and Light Brahma; and here let me say that no matter what the breed is, the Almighty has so fixed that thing that they will all pay a profit, if properly managed. A man wants to take the breed that pleases him, and if he does that he will be likely to take good care of it and make a profit. One man likes the Black Red Game, another the Brown Leghorn, and another the Brahma. I do





ROUEN DUCKS

not agree with those who say that the Buff Cochins are the best birds of the lot. The Buff Cochins are a splendid hen to raise chickens, and they are handy to have for that purpose. They look large, but they are not really so. They are very full feathered, and their feathers make them look large.

MR. VINCENT: The Black Spanish do not want to sit.

MR. FELCH: No; but they are of weak constitution. Still, I can hardly say that, because, when once grown, they seem to be hardy, if you can keep them away from the frost. Their wattles and combs are easily chilled, and that seems to take all the life out of them until spring.

QUESTION: What do you consider the best cross?

MR. FELCH: I consider the best cross in the world is the cross of a White Leghorn cock on a Light Brahma hen. I say a *White* Leghorn, because that cross will produce a uniform white color. There will be no parti-colored feathers, which is an advantage in preparing poultry for the market.

QUESTION: What would be the quantity of eggs produced by that cross?

MR. FELCH: They will produce as much as either of the thoroughbreds. I have birds in my family of Brahmas that have laid for twenty-three successive months without sitting; but that is unnatural. I have received several letters this season from parties to whom I have sent birds of this family stating that their birds have laid the entire season without wanting to sit. The Brahmas, both Dark and Light, do not lay in that way as a rule.

The Leghorn I call a hardy bird. The Black Spanish I call a delicate bird, because they are predisposed to disease. The whole Spanish class must have dry, warm quarters, or they will have the roup. They will have catarrh in the head, and roup follows, and all the attendant diseases. You cannot put them in a damp place with impunity.

MR. CHEEVER: Is there any limit to the number of eggs that any one of the breeds of hens can lay? I think I have seen it stated in some paper,—from a French authority,—that the ovaries are limited. Do you know anything about that?

MR. FELCH: I do not feel competent to answer that question. I have seen it stated that a hen will not lay after she gets to be four or five years old. But two years ago there was a light Brahma hen at the Exhibition in Boston that was twelve years and three months old, and she laid three days out of the week. I have had a Light Brahma in my yard this year eight years old, and she laid some forty-odd eggs. I believe, therefore, that hens will lay until they are pretty old. I do not believe, as some do, that they will cease laying at four or five years of age, but as a rule, birds after they are three years old begin to fall off in the production of eggs.

QUESTION. Are not pullets the most economical kind to keep for eggs?

MR. FELCH: The second year appears to be the year of greatest profit. You may raise two chickens,—a pullet and cockerel,—and the day they are twelve months old the pullet will have supported herself and the cockerel, and if sold at the end of twelve months

that cockerel is net profit. You may base your calculations of profits upon that and you will find it to be true. A Leghorn, when she commences to lay, will lay usually until she molts, and generally will not commence to lay again until the next spring. But you get the start of a year, or longer, before it comes to that, if she has good blood in her.

QUESTION. If you were only keeping a few hens for eggs, what kind would you select?

MR. FELCH: If I were keeping hens for eggs alone, I should most certainly keep the Leghorn breed in preference to any other. Keep the pullets up to the time of molting, and then sell them and replace them.

QUESTION. Have you had any experience in regard to the laying qualities of the Hamburg?

MR. FELCH: The Hamburg family will lay as many eggs, probably, as the Leghorn. They are handsome birds, and if any one has an eye for beauty, and wants a few handsome birds for eggs alone, I should recommend the Hamburg family. They are a little tender in raising, but like the Black Spanish they seem to become hardy afterward. They lay well. I have had Hamburgs that laid one hundred and fifty-one eggs in six months. That is recorded in the report of the Middlesex South Agricultural Society for the year 1858, and it is also reported, I think, in the State Agricultural Report of that year. The Black Hamburg is, I believe, the best of the family, for their chickens are easily reared, and that, perhaps, is attributable to a cross. I think there is a Black Spanish cross that went into the original Golden Hamburg, that produced the Black Hamburg. The other varieties of the Hamburg

family are the Silver and Golden-Spangled and the Silver and Golden-Penciled. The white and black are two varieties of that class produced within my recollection.

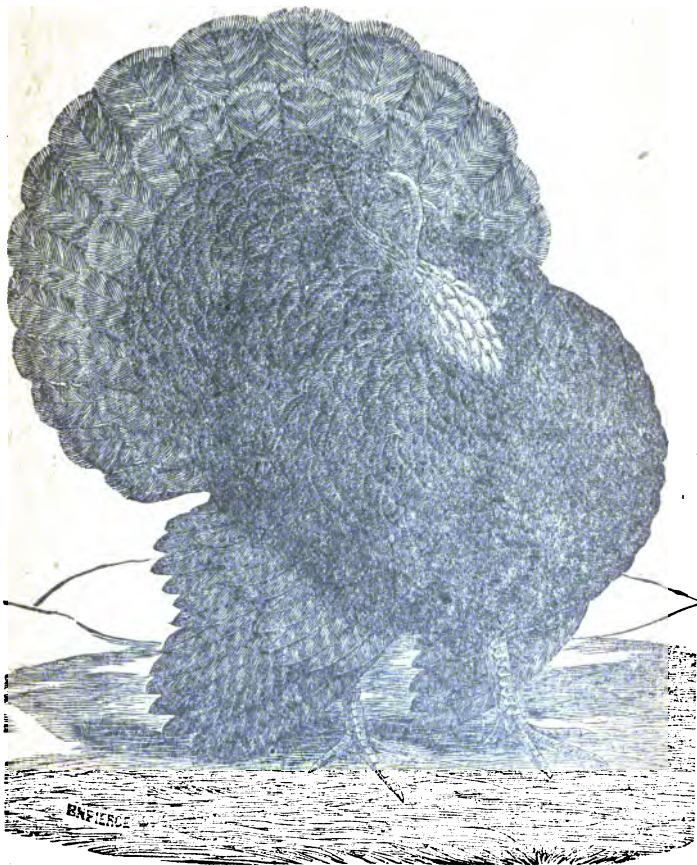
QUESTION. How long do you allow your chicks to run with the hen? Do you have many deformed, one-sided chickens? I am troubled that way.

MR. FELCH: I do not take the hen away until she weans the chicks herself; yet it is as well to remove her to the laying house when the chicks are from five to seven weeks old, according to the season. I have the partings, or slats of my chicken coops, three inches apart, and when my Brahma chicks raise one or both wings to go in or out of the coop, I leave the door open, for in squeezing in and out through the openings between the slats they easily slip their hips down, thus making them one-sided, or deformed, as you have spoken of. I have seen an entire brood ruined by being reared beside a picket fence of one and one-half inch spaces.

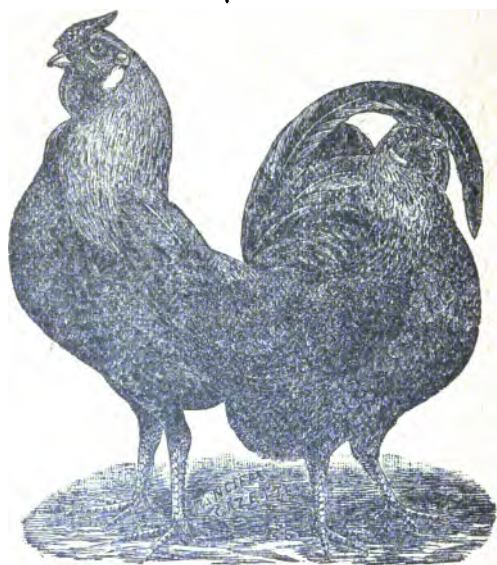
The foregoing discussion clearly shows the interest the farmers of the country are taking in this great question of poultry culture. They look upon it from a money point of view. They want to know how many eggs can be produced, and at what cost, and demand practical worth with exhibition excellence.

The rule with all breeds should be to kill all the inferior specimens, whether they be male or female, and demand that the beautiful specimens be so in a double sense, "Handsome is as handsome does."

If we breed from none but the most prolific layers we shall the more surely improve our stock in laying



BRONZE GOBBLER.



ROSE COMB BROWN LEGHORNS.

qualities. The policy of keeping all the females is a bad one; they should be weeded out if they are poor layers.

While the results quoted in the essay have been accomplished, and can be again, we can cut down the figures to a net profit of one dollar per head, and the margins are then even better than can be realized upon cattle or horses.

There is no danger of over-stocking the market, for poultry seems to be a necessity. Our southern brethren are in a large measure dependent upon it in warm weather. In all seasons it is to be preferred to beef or mutton and it always rules higher in the market.

So long as beef, mutton and pork remain at their present prices, and when (as is the fact) a pound of poultry can be raised for the same price per pound, we see no reason why it will not be a profitable business. Even in this season of low prices in other provisions we find fresh eggs quoted at twenty-seven to thirty cents per dozen, in August, and corn but seventy-five cents per bushel at retail.

A bushel and one peck of corn, or its equivalent, will support a laying hen one year, and if she produces but eleven dozen of eggs, no more than is obtained from the unimproved sort, it will leave a margin of two dollars and thirty-six cents per head for the care of the flock, which would pay, we opine, as well as the majority of the professions.

We would not counsel the use of mongrel stock, as breeders, under any circumstances, nor the use of deformed specimens, only in the case of necessity. Even deformity caused by accident may have so shocked the nervous system as to affect the breeding.

We know of a case where a hen had her foot caught in a steel trap and, being in it some time before being liberated, had her nervous system so shocked that after the toes were amputated five-sixths of the chicks hatched from her eggs the following season were club-footed in the limb corresponding to the one mutilated on the dam. We know not all, nor even a small number, of like accidents would produce a similar effect, but we cite the case to show that if an accident can affect the breeding how much more an hereditary deformity would affect it.

Cross-bred fowls are, in the majority of cases, far more prolific as egg producers than the native, or even the thoroughbreds from which they were bred, and in all animal or vegetable life this will be found true. Therefore we must always produce them from the two thoroughbreds, for to breed from the cross will be to deteriorate.



CHAPTER V.

ON THE TREATMENT OF BREEDING-STOCK.

A FEW general remarks as to repairing diseased or broken plumage, etc., may not come amiss.

If in white birds, or in the white in parti-colored specimens, colored feathers appear, especially if black feathers appear in white, they will oftentimes, if pulled, be replaced by feathers true to the color of the breed.

Young cockerels are often attacked by older birds and their plumage marred, in which case the feathers so injured grow slim and longer than the others. We have seen sickle feathers, corrugated along the quill and white in a black tail, removed, and afterward replaced by a perfectly black pair. We should not despair of an otherwise exhibition bird till we had removed these diseased and faulty feathers and given time for them to grow anew, for the majority of cases prove their restoration true to color.

The only way we can keep our stock in presentable plumage during the breeding season is by watchfulness, and by removing all diseased and broken feathers, which will be replaced by new ones; otherwise the fowls must wear their broken plumage till the molting season, and look badly.

A Light Brahma having say from two to twenty black-tainted feathers in the back, if they are pulled, will often replace them with white ones. The process can be repeated till all are secured true to color.

The best time to hatch the breeding-stock we believe to be from May 20 to June 10. Such birds come in the time of year when they do not suffer from cold, and they grow rapidly and continually till mature.

Cold weather comes on just in time to check their laying, and generally they will not have laid more than ten or twelve eggs before we are ready to use them, and we get them vigorous from the freshness of young productive life. Again, the adult fowls molt and rest, and generally have laid but few eggs before their eggs are needed for incubation. From such pullets, and these rested hens, we believe the best eggs for incubation are procured. Early pullets that commence laying in the fall, and lay through to March, sustaining a strain of six months' laying, we do not consider as good for the breeding-pen as the pullets named above. We believe the time and the way which approaches nearest nature's fitness of things the best to produce our breeding stock.

The first forty eggs laid by a hen after molting, or the eleventh to the fiftieth egg laid by a pullet, are better, and the chicks from them prove larger and finer, than those laid afterward during the same breeding-season.

Cockerels are the safest for winter breeding. A good plan is to use a cockerel till April 1, and then turn the harem over to a young male coming two years old, from which to raise your breeding-stock, thus pro-

ducing them in the time of year nature intended. Such birds generally have more symmetry and merit than those unnaturally produced.

There can be no definite rule for number of females to one male; this the breeder's good sense must determine. There must be enough so that copulation will not be accompanied with coercion. This number will be found to be in Asiatics, from eight to fifteen; in Plymouth Rocks, ten to twenty; Houdans from ten to fifteen, and in Leghorns the number can still be increased. Where less numbers are kept the male should not be allowed to run with the females constantly.

Experience teaches that twenty are better than two. Two years ago we had birds penned in numbers ranging from six to eighteen, and in every case the eggs from the larger number hatched the best. In one pen they utterly failed, and when we increased the number to fifteen birds nearly all the eggs hatched, and the progeny were largely female.

The feed while the plumage is growing, both in chicks and molting fowls, has much to do with its color. Writers affirm that the reason wild birds are so stereotyped in color is because of their freedom to select just what food they need. We do not think it so much the kind as the supply of it, and protection from the injurious effects of the sun, that controls the color; nor do we acknowledge that the wild partridge is any more stereotyped in color and form than Partridge-Cochins. This question was raised at the Connecticut Poultry Exhibition, when H. F. Felch and H. S. Ball retired to the market and plucked feathers from different partridges and brought the same to compare with the

Cochins then on exhibition, which showed them to be no nearer uniform in plumage; another fact, the partridges had both smooth and feathered legs.

If a chick be starved, it will not only be dwarfed in stature but will fail in color. We have seen speckled half-starved Light Brahmas when put on generous diet slough their objectionable coats and grow plumage true to their kind.

The finest specimens are those that do not cease to grow from the time they hatch till full maturity. A chick that suffers a severe check in its growth while young seldom proves a prize bird, and when hatched in winter provision should be made for producing green vegetable food in the way of green oats, to carry them through till the grass comes in the spring.

The care of the flock does not consist entirely in furnishing it enough to eat, but watchful oversight, seeing to it that they do not huddle in large numbers in one place at night. We used to think that it was injurious to allow them to roost before six months of age, but we have altered our opinion and recommend it at the age of sixteen weeks. They should be induced to occupy low perches two inches wide, for there will not be one-half the injury arising from this as from the poisonous influences of their exhalations when crowded into small coops.

If we take pains to cover the chicks whose weaning comes in a cold season of the year by throwing a blanket over the coop to keep off the cold night air, or to coop the broods in the afternoon when cold east winds are blowing, we many times secure the season's success. By these little attentions at just the right

time we enhance our chances of winning at the winter exhibitions.

We can assist nature to do her work perfectly. We do not consider it a sin to straighten a hare-lip or crossed eyes in our children, or, if the muscle of the leg be contracted, to use the knife, that they may walk without limping the remainder of their lives, nor do we consider these things injurious to reproduction. And taking this care of our own offspring wherein is the sin if by judicious means we secure perfect development in our chicks? In nine cases in ten chicks hatch with a perfect organism; now is not any work legitimate that secures its perfect development? Should a chick hatch web-footed the web should be cut back to its proper structure, thus liberating the toes to grow in their legitimate angles. While the comb in Light Brahma chicks will hatch perfect, its peculiar shape makes it less likely to develop properly than a single comb. In many cases bad combs can be prevented by proper treatment.

The first thing that nature does in case of a wound is to repair it. Therefore, if the middle division is seen to be growing too rapidly, the serrations of this division should be pricked with a sharp instrument so as to make them bleed. This process will check the growth of this division and allow the side divisions to grow into proportion with it. If the middle and one side seem to be growing faster than the other side, the same process of treatment applied to both will allow the weaker division to grow into proportion with them. An old cock may give a chick a severe peck on one side of the comb so as to turn it to one side. A cor-

responding wound on the other side will maintain it in its proper position. By this means we succeed in making the comb *grow* into proper shape. Is it not better to do so than to let it grow into an irregular, deformed mass, and then turn butcher and cut and slash the comb, making a bad job of it, and receive the just censure of our fellow-breeders? Three-fourths of all the bad combs are the result of external causes and unnatural feeding to produce very large birds.

The leg-feathering can be wonderfully assisted in its growth, and many a crooked toe saved, by pulling all foul feathers. The skin of the foot and leg is tough and the feathers oftentimes grow along under it from one-fourth to one-half an inch before penetrating the skin, thus causing the toe to turn in. We have pulled these feathers four times before succeeding in making them grow properly.

The breeders and amateurs as a rule are too lazy to attend to all this minutiae (and the writer is as guilty as any one he knows, yet a guide-board may tell the way, if it does not go itself).

CHAPTER VI.

LOCATION.

WE have in our introduction endeavored to show the magnitude, and create an interest, in the poultry culture of our country. To such as intend to make it a life business the selection of a location becomes one of vast importance. Where man finds a healthy abode poultry may be expected to thrive. Yet a clay subsoil, unless the land be very rolling and all surface drainage complete, should be shunned; when flat and marshy, with no retreat from it, will always bring failure. A clay subsoil, if it be a slope to the southeast, south or southwest, terminating in a meadow lot through which a stream may run if underdrained, becomes one of the very best of situations upon which to raise poultry. All houses upon such land should be floored over, leaving an air space between it and the ground. At the very top of the elevation, if the land be trenched for 18 inches in depth beneath the underpinning, the same terminating in a drain, would enable you to dispense with the floor. Yet safety upon such soil demands a floor to all roosting and laying departments. Such underdrained lands are strong, producing heavy crops of grass. Therefore they will support much larger numbers to the acre, and their heavy grass crops,

while they furnish the forage for the fowls, consume more completely the dropping as plant food, and secure a healthy condition of things. A constant supply of grass does much more to keep the egg-basket full than many are willing to concede.

Light soils are good, but demand far more work in cultivation, or the number kept upon the acre must be far less. We believe it far better to keep no more upon the land than it will furnish green food to than to confine large numbers and furnish the feed from other lands. If the land be light, oats must be cultivated for green food (we say oats, believing them best for this reason: they contain twenty-two per cent of muscle and three per cent of bone).

The land needs cultivating also by the use of the horse-hoe to keep the surface fresh and clean from the collection of the dropping. This hoeing should be done regularly. When the vegetation fails to assimilate the dropping it generally kills out all vegetation. The surface becomes hard and sour. Cut into it and you discover a thin green crust. Long confinement of fowls on such inclosures is fatal to a healthy condition and a high state of productiveness, and eggs laid by these fowls are to a large extent infertile.

The old idea that any land is good enough to raise chickens on is a fallacy. Let one flock be grown on a rich soil, abundant in honeysuckle clover, and note the health and prime condition of plumage, the molting always complete. In contrast to this, see the occupants of a sandy hillside, where the grass crop is meager and sorrel abounds, in their faded spotted plumage, which indicates incomplete molting and light, thin condition.

In the one case they get insect life and vegetable food in abundance. In the other they depend upon their attendants to furnish it, which in many instances is not forthcoming. If this difference is discernible in the plumage, there will be equal difference in muscle also. We know this difference exists, and following it one gets less eggs by full twenty per cent from fowls grown on poor sandy soil. Land that will produce three tons of hay to the acre will support four times as many fowls as will an acre that produces but one ton. Land on which water stands should not be used except for geese and ducks. For them even a meadow lot, where the water does not reach the magnitude of a pond, is far better, for constant indulgence in water is by no means advantageous to ducks till six weeks old. When nature gives us a hillside of loam with gravel subsoil, inclining south to heavy soil, and terminating in a meadow lot there, in such we have the best of all locations, for in such we have instant drainage from about our buildings, yet a soil that brings to the surface the earthworms every night, and as the season advances, even in summer, the fowls find in the meadow a cool forage ground rich in slugs and insect life.

Have any of my readers watched from their chamber windows the chickens as they come from their coops at half past three in the morning, and deploy out into a skirmish line that sometimes covers acres, leaving the feed laid out for them the night before? See them return to the coop and a short season of brooding under the mother-wing, and wait the daylight to come out to their breakfast of grain. Why do they do this? Take your lantern some morning and take a

stroll with them, and see on your walk the earthworms laying at full length on the surface, also the insects, the beetles, the grasshoppers, cold and stiff in the cold dew, at the mercy of your flock of chicks. Kill some morning a cockerel that has taken this morning walk and you will find his crop well filled, and you will have the solution of the mystery and the origin of the old saw that "the early bird catches the worm." Again, watch just at twilight, after the chickens have eaten their evening meal of grain. All go on a grazing expedition, feeding upon grass as regularly as possible in your pasture lot. With these things before your very eyes you no longer hesitate as between rich and poor land as a location.

If compelled to raise on poor land, then keep the horse-hoe at work. Sow the oats for green food, furnish fish and flesh and grain in abundance. Fowls will consume what is equivalent to twenty pounds of hay a year, and the acre that produces three tons, with the fall feed taken into account, will support four hundred fowls and keep green. Such luxuriant growth would consume all the dropping and save a vast amount of labor in cultivation of a soil so light as to support one hundred fowls only. To keep fowls without cultivation involves much more labor in the distribution of the food, for to feed ten thousand fowls on one hundred acres, or on twenty-five acres, will make quite an item in the labor account. Yet there are locations where a loam soil, having a subsoil of gravel, with sand beneath all, would admit of houses as described below,—these houses the ends and back of which could be made with cement.

In most of our pastures there are dry knolls and

southern sloping hillsides, in which excavations could be made fifteen by twenty-five feet, the ends and north sides walled up, leaving but the one side of the laying room and roof to be built of lumber; even the roof could be thatched, or earth-covered. All of which could be home-constructed, or by the employment of cheap labor. These habitations would be warmer in winter and cooler in summer. These quarters, located far enough apart to save the expense of fencing for yards, would save the labor of forage crops and all meat-foed till the frost cut off the natural supply.

No farmer should be excused from utilizing all such facilities adjacent to his building, which, with the barn-cellar and orchard, would in most cases enable him to keep at least two hundred and fifty fowls, all of which could be cared for by the younger members of the family, and the profits would secure older and abler help for the heavier work of the farm, while many a boy would be made a thinking, practical farmer, happy in his lot, who is now chafing under his hard home-life, waiting only for age to liberate him.

The effect of geographical location we should not forget in this connection. He who thinks to succeed in poultry culture without almost eternal vigilance, and the practical application of the doctrine that prevention is far better than cure, had better never commence. Yet one who will put the same care and study, the same close attention and watchful business energy, into this calling as are employed by our merchant princes or bank presidents in their calling will surely succeed. He who trusts to luck in the majority of cases fails. We therefore do well to consider the

fact that the northern, middle and New England states are exempt from cholera, but that her cold, flat, wet lands engender roup and catarrhal affections. That along the shores of the Atlantic and Pacific oceans cholera is the exception and not the rule, and that there high lands are exempt in a large measure from roup. Where cleanliness in the quarters is maintained the salt sea breezes seem to have a salutary effect. The short intervals of snow in these reigons all help in the preservation of health and profits of the business. The balance of the states being not free from chicken cholera the breeders have to watch and strive for health by greater care, by keeping fewer fowls together, and by more cultivation and the feeding of less corn, and free use of sulphur, to fight the competition of the other states having only the longer seasons, whereby to compete successfully. In fever and ague districts, fowls are more liable to suffer from cholera than in sections of the same county even that are free from it. Thus to him who would make poultry culture a business the question of *location* becomes one of the greatest importance, and failing in a perfect location we must by artificial means and man's device convert it into such to a certain degree before we can hope to be successful.

CHAPTER VII.

BUILDINGS AND FURNISHINGS.

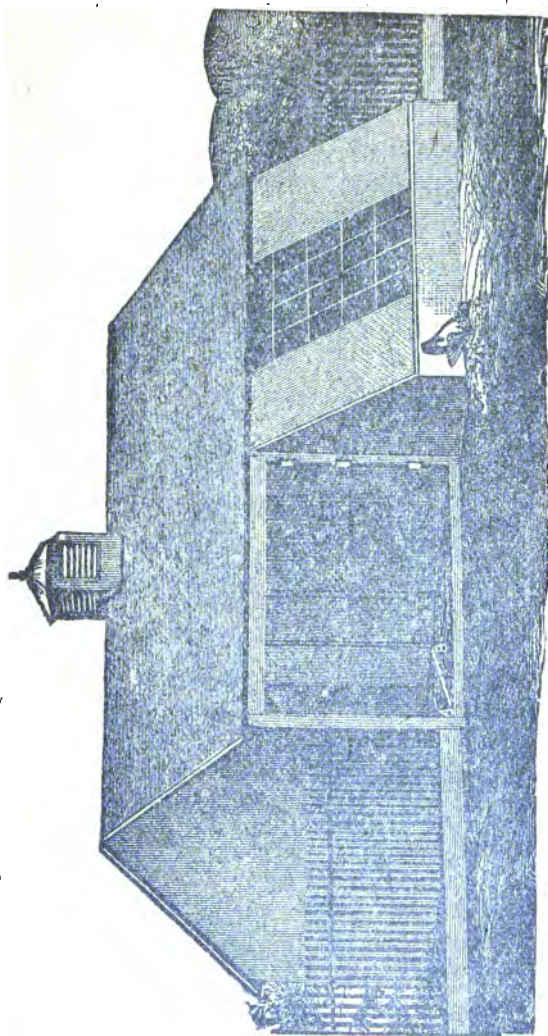
IT is no part of our purpose to present plans which we would not use ourselves, but rather to present that one which we deem the best for all practical purposes. All buildings must in a measure conform to the necessities of the locations upon which they are reared. Therefore we can only present our theory, and leave the reader to use it as best he may, by remodeling his old houses or using our plan in his new structures. It has become a necessity that fowls must have exercise in the open air each and every day if we would be certain their eggs will hatch in the winter months. And all broilers for the months of February to July must be hatched in the cold months of the year. One-half of the cause of eggs hatching poorly in March and April is the fact that the fowls have been housed closely all winter.

Our cut represents the best and only plan so far published in which with the least trouble, in the warm portion of each day a sun and dust bath in the open air can be enjoyed by the fowls, and the balance of the day the same space can become additional house room. An open shed protected from wind and storm is the place of all others a fowl will select for the purpose. The cut we take by permission of the Ferris Publishing

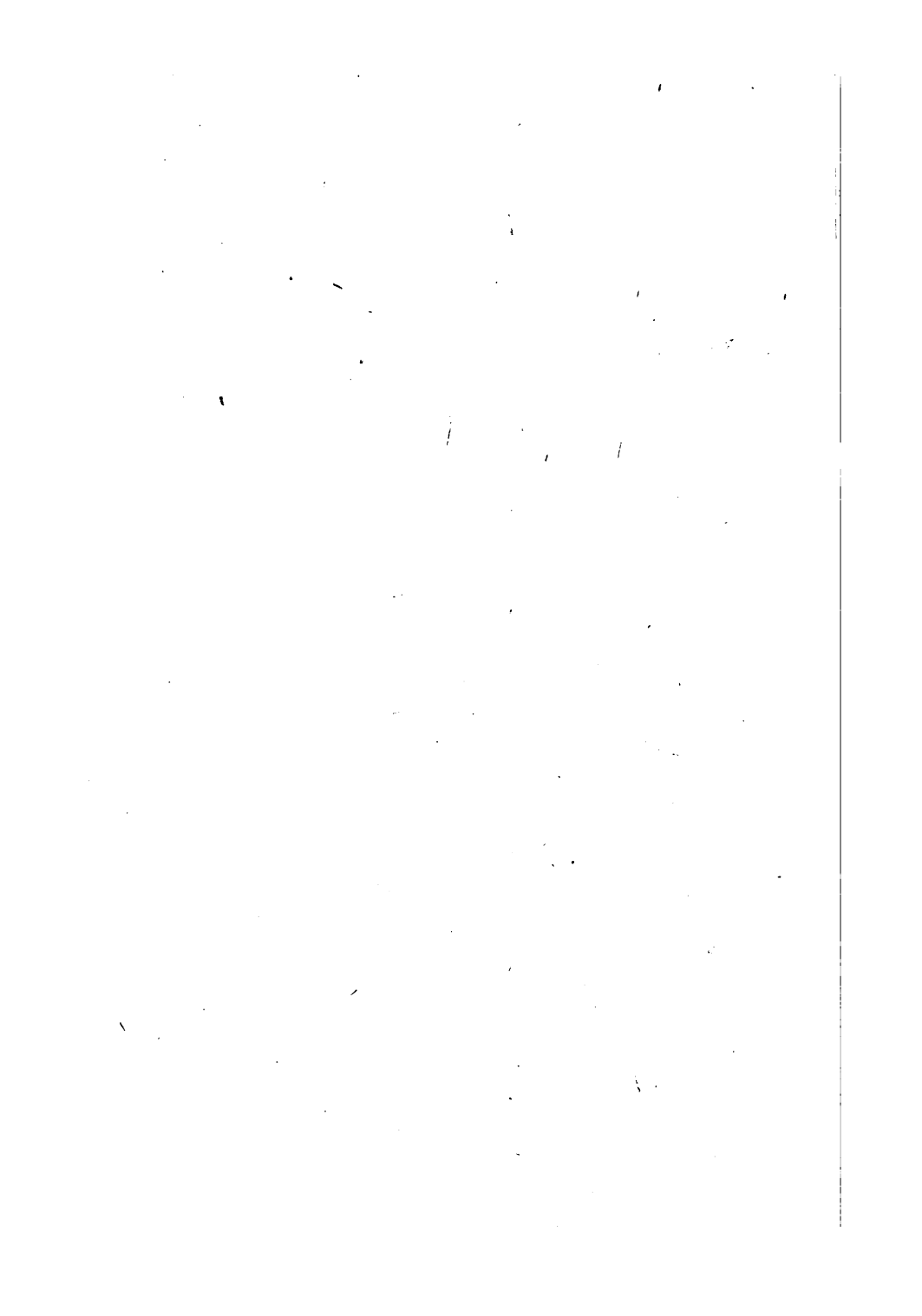
Co., from their work, the *Wyandotte Fowl*, it being our original idea. These open sheds, having a southern exposure protected from wind and storm, enable the fowls to enjoy the open air each day, by the attendant at 10 A. M. opening the front by swinging it inward, and thereby completing the partition which makes the inclosure of the laying and roosting room, while the balance of the house becomes an open shed, which as such the fowls enjoy until the sun begins to get into the west and the air becomes too cold, when the keeper returns the partition to the front, and our building becomes a house entire. In mild weather the partition can stand ajar, the better to air out the whole building.

This plan represents a building 13x25, which, so far as the laying room goes, having the two-foot projection, makes that room 15x15, and a shed 10x13. The front posts 7 feet, rear posts 5 feet, front roof 8½ feet, rear 11½ feet, the smaller door being hinged to the swinging front, the two covering ten feet, leaving three feet of stationary partition, which completes, with the door, the partition, when the building is divided into shed and house. This arrangement saves a vast amount of labor in shoveling snow or littering down in front of the ordinary fowl houses, and the fowls may enjoy the air, for they will not travel on snow if they can avoid it.

Fowls may be housed closely all winter, and by high keeping be made to lay a large average number of eggs, but not one of them will hatch. This is why we urge this plan. If you are in the egg trade it will save you hundreds of disappointed purchasers. It will



POULTRY HOUSE.
(Described on opposite page.)



insure you a larger brood of chickens from the eggs you set at home. This is but the repetition of advice given ten years ago. In severe cold weather the plan gives us the whole in enlarged quarters made secure from the weather. In heavy rain storms the fowls are no longer forced to take shelter in the fence corners or under the cart, which only form a poor protection. Again, this plan puts the breeder in a position to sell eggs that will hatch all the winter through. There are many inquiries for eggs for the incubator trade during the cold months. If you anticipate running incubators yourself, to raise broilers by artificial means, then you cannot do without such a building.

These houses can be built double, the whole being 15x50 feet, a solid partition in the middle making two laying rooms 15x15 and a shed of 10x15 feet at each end of the house. Such houses built in rows, with a fence running from the front of the one to rear of the other, would secure the fowls in colonies of fifty each; the buildings being ten rods apart would secure their returning to their own quarters to lay and roost, —the plan we deem the best of all with which we are acquainted. If you desire others, there are works at twenty-five cents each in which you can have your choice of a hundred styles in architecture. But we present no other plan, for we know this will secure the best results.

In the coldest sections of the country we would recommend they be constructed and finished by tacking tar felting on to the frame, then board in, and from the inside tack the lapped edges of felt to the boarding. This would make it wind tight and warm enough

to defy an arctic winter. Built of matched spruce, the cost single is \$85, and double \$160 each. But as different localities will vary in cost we refrain from giving specifications; each tenement will house fifty fowls in health and productive condition.

The droppings from fowls are very poisonous, and it is very essential that they have thorough ventilation. At the same time we must not expose the flock to a direct draught of air. Fowls left to themselves will not stand in a draught, and when compelled to, they take cold as easily as does the human family.

The ventilators should reach the floor. In winter, ventilate from within three inches of the floor, and in summer from both top and bottom of the room. The bad air falls and is drawn off from the bottom, and saves the heat made by the solar action by your glass fronts, and as the warm air rises for the same reason to ventilate from top we lower the temperature and make the room cool and comfortable. In the winter, when dull cold weather at times collects the congealed respiration from the fowls in an anchor frost, this is soon disposed of by burning a kerosene light for a short time, and the opening for a short time of the upper ventilation, and all that damp, chilly sense of feeling when visiting the house will be disposed of. Remember this and see to it in time to save you many cases of roup, and thereby keep up the egg production. A window 4x6 feet in the extension front and one 5x3½ in the swinging front, the sill eighteen inches from the floor, will warm and light the rooms, dry out the gravel loam, which will help in the work of deodorizing the dropping, enabling you to keep a larger num-

ber on the same space than otherwise. The plan of having the whole front constructed of glass is bad, for in that case the house becomes too warm in the daytime and cools rapidly at night, making so much change in the temperature as to work disastrously. Even with the windows we recommend if in winter shutters were used to close over them they would make the house much warmer through the night.

Avoid all permanent or box-made nests, which become harbors for lice. Avoid also the old plan of an inclined plane for roosts, for all the fowls will strive to occupy the highest perch, and many a fight and fall will be the result, which will vastly increase the list of casualties, while the low and level plan saves many from lameness and internal injury; for while a hen will walk up to her perch, if she has the chance she will invariably fly down. Roosting low makes them less breachy; even the smaller breeds, if reared on low perches, will not require a fence more than four and a half to five feet high to fence them in. The floor of the house should be kept covered three to four inches deep with a coarse-fine gravel, not so fine as to be called sand, yet having a loam mixture in it. This will deodorize all the filth and stench, besides making a loose and soft substance to alight upon in descending from the roosts.

Across the rear of the laying room construct a platform three and a-half feet wide, thirty inches from the floor, and one foot above the same make the roosts by having them extend from back to front across the platform, eleven short roosts three and a third feet each. This can be done by two stringers, one at the back,

hinged to the house, the other thirty inches forward furnished with legs one foot long, the whole to swing up while cleansing the platform, which should be done every morning where fifty fowls are kept in a flock, and not be left till afternoon.

Why do I not have the roosts longwise? A boy would say "Because." I say so to, for fowls will crowd and will roost very near the same place in the roost each night. These short roosts will hold but five birds. If two long roosts were put in longwise, they would all crowd for the back roost, and the front one would be used by those unable to get a foothold on the back one. Can you not see that such a plan is best? Fowls are more sensitive than they are credited with being. This crowding will effect the egg-basket. One of my breeders who has bred Light Brahmas for me twelve years says: "When you come over here leave the dog at home, for the excitement *caused by him* among the hens costs me *a dozen* eggs every time he comes, and some soft-shell eggs laid at night upon the roost." So everything about your building that will conduce to a quiet and comfortable life means a gain for you in eggs. The width of these roosts should be about two and a half inches, the sharp corners rounded off.

Under the platform it would be well to construct a rack to hold common nail kegs. Let them be laid on their sides with a stringer three inches wide against which the open end of the kegs may rest and face inward, so that the fowls will approach the nest from under the platform. The fifteen feet will enable you to get in twelve kegs, or nests. Make holes in the bottom large enough to admit the hand to gather the

eggs. The rack being portable the kegs can be removed at will to be scalded or lime-washed, to prevent lice from infesting them. The nests will be just high enough to cause the fowls to take a short spring to approach them, and as they step in they cover the nest; having laid, they jump down and are away from them. Nests so low and easy of access that a fowl can stand upon the floor and reach the egg are conducive to egg-eating, while this plan, with one or two earthen nest eggs kept in the nest, will seldom bring about the evil. The plan gives a sense of security and secrecy. If you have only a village lot, and are limited in space, and the flock has from necessity to be confined upon the least possible amount of ground, each house and shed should have two yards, that one may be sowed with oats while the fowls occupy the other—and when the oats are four to five inches high, let the flock occupy this yard while the other is treated in like manner, thus furnishing the raw vegetable food so necessary to them. Besides, this treatment keeps the yard clean and sweet. These fowls, so yarded, will eat all, even scratching the roots out of the ground, giving them a needed exercise.

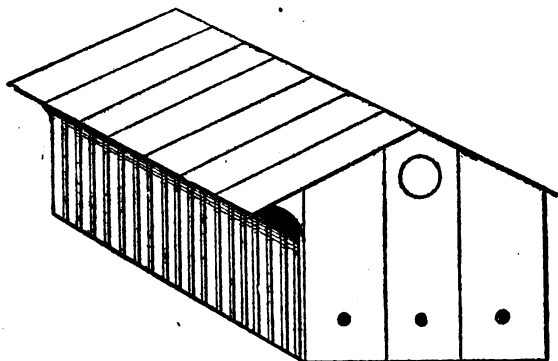
Do not forget that if you would reap the best results in eggs, and eggs that will hatch, that the closer you follow our advice in this matter the better you will be off. If you sow these yards but once in a season you may fairly calculate that your profit will be fifty cents on the dollar, and the death rate in your flock large. Go into a hen yard that is so small as to be barren, and cut down with a spade, and for about an inch of the crusted top you will find a dirty green mat-

ter, full of poison to the fowls. Do you wonder that they die of cholera or suffer from scurvy legs when confined for months in such yards with no green food? Why should they be otherwise? And yet we keep them there and eat the fowls so confined.

We are aware that small flocks give the owner a greater individual yield in eggs, but when we are building for their sole use, and catering for large numbers of them as a business, we can best do this in houses of two tenements for fifty each. Poultry-raising must of necessity become of more and more importance, and in view of all this we have recommended the building to that end. If 5,000 fowls are to be kept, it is an easy matter to construct fifty such houses. If you wish to limit your operations to a home flock, then build a small house on the same plan.

To build for the use of growing chickens on the farm, or wherever the natural way is adhered to, which is of course the best way, we have but one plan to offer. We have to nearly grow the young stock to replace the old before we are ready to kill off the old fowls. These chickens from this necessity have to occupy their chicken quarters into the fall of the year; at least it is most convenient for us that they should. Many a breeder uses old three-cornered coops because they used to do so in old times; many know better, and are aware that the extra growth and merit in one season's crop of chickens would more than pay the cost of new ones, yet he will keep on making them do, knowing that the sooner he shall resort to comfortable quarters that all subsequent seasons the change will bring him a profit.

Our plan is to hatch enough chickens at one time that we may double up the broods and give twenty chicks to one hen to occupy the coops, as per cut below, being three feet wide at the base and five feet long, with thirty-inch posts, with a paling frame, the paling being three inches apart, used in the front while the hen is confined therein with her brood, the same being removed at weaning time and three roosts put in,



MODEL COOP FOR TWENTY CHICKENS.

as indicated by the three dark spots. In this house the twenty chickens can harbor till the fall. Five such coops as these would serve a colony of one hundred chickens if placed twenty-five feet apart, say upon a square, 30x30, with the odd one in the center. When the males are removed, at twelve weeks old, to be shipped as broilers, two of the coops could be removed to serve a later hatched colony, the three coops remaining would be sufficient to accommodate the pullets till they were removed in the fall to the winter quarters made vacant by the killing of the old stock.

These quarters should be thoroughly cleansed with lime-wash, and fresh gravel and loam supplied to the floor to the depth of four inches, when they would soon repay your outlay by discounting in the shape of eggs.

A single brood of chicks will thrive and take care of themselves. With care, one hundred can be reared in a flock, and all do well. But if more are to be reared care should be taken to confine those of the same age together—the February and March chickens in one field, April and May chickens in another, and those hatched later in a third. With such care each lot will be found to do well; but if running all together the young ones will get trampled to death by the older ones. One hundred chickens hatched the same week, colonized upon one feeding lot, would all grow up an even lot. These colonies could be located so as to feed four hundred upon an acre of land, and the result be good.

Smaller coops for village use, where one or two flocks are reared for home use, can be made thirty inches square, sides fifteen inches high, double roof, sides, end and roof made of matched board, except the front end, which may be palings three inches apart; these will accommodate twelve to fourteen chickens till the fall. Many think anything will do for a chicken coop, and stakes driven in front of a barrel are resorted to regardless as to how near one paling is to another. In confining hens with their chickens the distance between the palings should be no nearer than to confine the hen, and when she weans her brood the door to the coop should be left open. The nailing on of the slats so near as to make it difficult for the chickens to squeeze through

is the fruitful cause of so many crooked, ill-formed fowls. We have seen an entire brood so deformed from being reared beside a picket fence. It is pleasant to see a bird grow up perfect. But this deformity many times makes a difference of ten dollars in a man's purse at show time. Keep this in mind, my amateur reader, when building for the chickens.

In these larger coops it will be seen they are fashioned with an awning front. The natural tendency of the chickens to stand outside the palings to feed makes this a necessity in wet weather, and it prevents the hot sun from making the coops uncomfortable in hot weather. He who looks out for these little comforts in building does more than he thinks toward filling his purse in the fall. It is the last point that wins the prizes. In the use of the same coops spoken of, if they can be placed under a shed it will pay. We may have four birds to score ninety-two points and bring us ten dollars each, but if by care and these little attentions we bring one up to ninety-five points and win over all, the price oftentimes reaches *ten times that sum*. One such bird pays for this extra care and building for their comfort. One thing is certain, we never reach this excellence when we are careless of the well-being and comfort of our growing stock. And it is fair to say the whole flock is correspondingly better if your best one has beaten in a fair competition your neighbor's best.

We have no sympathy with the breeder who stands under a sun umbrella and watches his hens with their extended wings gasping for breath when he complains of the death-rate in his flock. Watch at ten to eleven

o'clock in a warm day and see the chickens and fowls retire to a shady spot and remain till four o'clock in the afternoon. If your yards are not furnished with shade trees then provide for shade by building open sheds. The expense will not be great and will prove to be most economical in the long run. In all buildings for poultry it is not the question what a coop costs, but what is the difference between what good coops and the *very best* coop will cost. *A coop is a necessity.* If the better one will secure you ten more eggs in a year from each hen, then in building for fifty hens it is policy to build the best one at an additional cost of fifty dollars. For the investment brings a twenty per cent income on the same. We believe the best is the cheapest in the end.

A building set apart for incubation is one of importance, yet it can be used for wintering males when not in use for hatching chickens. This can be any size one cares to make it, but it must be heated in winter to sixty degrees if you are to reap the best results. To build one convenient, and to accommodate the largest number possible, I should build 18x36 feet, with 7-foot posts, leaving a walk around the entire room $2\frac{1}{2}$ feet wide, and a 3-foot walk down the middle. Between these walks I should build two tiers of setting rooms, which would give me 120 feet in length and $5\frac{1}{2}$ feet in width. This would consist of a shelf on which to set the nest, and yard or dust-room to each of four feet. The room can be made in sections 4x4, in which three hens can dust as they leave the nest they occupy on the shelves spoken of, or one can carry the plan further and by partitions make each

hen a dusting room of fifteen inches wide and four feet long. Let the breeder do as he pleases in this. The plan gives space for setting ninety-six hens at one time. The lower tier can be upon the ground, the tier over it, the platform could be covered by earth four inches deep and by sprinkling down these runs occasionally the heat of the room would preserve a humid atmosphere. The nest boxes should be fifteen inches square. Being portable, they can be taken away at will to be cleansed and made up new. If the house be nine-foot posted a third tier of these nest accommodations could be added. Let the building end to the south, and glass four feet wide extend from sill to gable, the door in the north end. For a short time each day open door and window and have a draught of air through. To air it out in summer they could be left open and the room kept comfortable. In winter ventilate from the bottom, your ventilations reaching from floor to cupola. In heating this house let the temperature be forty at the bottom and sixty at the height of a man's head, which would be two feet above the second row of nests. If three tiers were put in we would let the temperature run down so that sixty degrees would register at the height of the third row of nests.

If only the ground was used one could build the rows by frames of wire eighteen inches high only, and all in portable frames to hook together. So, also, can the partition be portable, where two tiers are in use, and when you had hatched all the chickens for the season they could be taken down and packed away. This house in winter is a necessity if broilers are to be the business of the breeder. This house must be

warmed. Why, there are not three hens in five that show a disposition to set before April 1st that will hatch a chicken, for the reason they have not heat enough to counteract the atmospheric influence and to hatch the eggs. The warming of this room reduces the atmospheric influence to summer heat, and leaves the heat of the hen to do the work. Nature times the incubating inclinations of the fowls and birds at a season when sixty degrees of Fahrenheit heat is the average temperature. This plan is the best as a saving of labor. If you will carry it out to setting two hens in one yard, dividing into thirty inch by four feet yards, there will be no trouble, and when they come off with their broods, as a rule, will agree. We would heat the house by means of a common hot-house boiler, running the waterpipe around the entire room, the boiler being stationed in the north end, at the door, and passing the pipe down the west side and returning on the east.

These nests I would make up by a layer of carbolic lime in the bottom and hay chaff above, with as little hay or cut straw as would nicely form a nest, which should be made flat on the bottom (and by watchfulness be kept so), the nest being large enough for the eggs to lay without crowding, the shape to be as near the shape of a well formed egg cut through from end to end. If there is a raiser who does not comprehend my meaning, let him boil an egg hard and cut it in two, longways, the flat side will be the shape of the bottom of the nest, in miniature. If chaff cannot be had, then fill the boxes up with sandy loam two inches, and sprinkle the earth well with water, and spread a handful of carbolic lime over it and build the nest of

hay or straw, not using a large amount. The heat will draw the moisture—the moist heat so necessary for success.

From November to March, even in these warmed houses, put but eleven eggs under a hen, unless she be of good size, when thirteen may be the number. After April 1st thirteen may be the uniform number used. Place all the nests on the outside, and feed from the middle passage, water and feed arranged so they can run their heads out through the slats to obtain it. These birds will invariably feed and drink before nine o'clock each morning, when all the droppings should be raked off by means of a fine rake and taken away, and the house have the airing out spoken of above.

After April 1st the chicken houses designed for twenty chickens (see cut) could be utilized by putting in a row of three nests on the back side, making the nests on the ground, and a portable yard for dusting be attached, all being outdoors. When they hatch, the house should be thoroughly whitewashed and one of the hens left with twenty chickens, before spoken of.

A very good mode of setting hens is to sink a barrel on its side one-third into the ground, filling up with earth even with the earth on the outside, using a small quantity of hay to form the nest, especially in early spring. This, you see, will prevent the cold air from reaching the eggs through the hay from the under side and chilling them, while the earth in the barrel becomes heated by the hen, which increases your chances for an early brood. Place one of the small chicken-coops described in the front of the barrel, and by the means of a slide-door admit the hen to and from the nest. The

coop becomes a feeding and dusting yard for her while sitting, and a home for her and her brood when hatched, besides preventing her from deserting her eggs. As the season approaches June and July pour into the barrel, before putting in the earth, a half-pailful of water. The heat of the hen will draw the moisture up and prevent too rapid evaporation in the eggs, and secure for you a better hatch.

By setting an even number at a time and doubling up the broods you can reset the hens thus released (which generally do better the second time), by which means you secure eighteen clutches of chickens from twelve incubating hens, which will produce, as a rule, about one hundred and twenty-five chickens that will be marketable. The overplus will be found to not more than make good the casualties and deformities.

This plan of hatching and rearing the chickens away from your fowl-houses releases them from and prevents the incubation of millions of lice, which are generally produced by setting the hens where they are in the habit of laying. If you wish to see every louse and red-spider louse, which is the same as the bed-bug for the human family, concentrated into twenty inches square, just allow a few hens to incubate in the laying room of your hen-houses. The day before the hens are to hatch, let the place of setting them be what it may, it will pay you to sprinkle the eggs and wet down about the nest, and to make sure that the nest is perfectly flat. At this time the egg-shells are very brittle. If the nest is hollow, so all the eggs press toward the center, the chances are that there will be more or less killed in the nest and more or less eggs will be.

come crushed in, and the chicken prevented from liberating itself. The chicken first, by aid of a little cone-shaped nib on the beak, presses against the shell and chips a hole. Air begins then to inflate its lungs, and he in his struggle begins to turn in the shell, he all the time pressing this nib against the shell. In this way he cuts a seam around the shell, and when this is accomplished the shell falls in twain and the chicken comes to the outside world independent of all else but warmth and feed to secure its growth.

If these shells become crushed in, then the chicken cannot turn in the shell, and it dies. The same is the result if the hen has set too constantly, and the chicken is dried in the shell, as it is called. The last is helped by immersing the egg in warm water for a moment the day before they are due to hatch. Sometimes breeders chip a hole in the shell and thus remove the chicken. When this occurs the keeper should break the shell away from the opening, and if where the chicken has broken through the inner lining looks dry for about a circle of half an inch down then the chicken must be liberated. This is best done by crumbling the large end of the egg, then rupture the skin and roll it toward the other end to prevent bleeding; liberate the head only and leave the chicken's body in the other half of the shell and place it under the hen again. If the hen has covered her eggs in a proper manner for twenty-one days, the morning of the twenty-second they should be examined and the shells broken, and if the chickens are alive they should be helped out, but as a rule those helped from the shell on or after the twenty-second day seldom live to amount to anything. The hen as a

rule will remain on the nest after the chickens are hatched for twelve to twenty hours, or till the chickens nearly all come out from under her and show a disposition to eat. Then she will leave her nest with her brood. If the hen is to be reset the chickens should be taken from her as fast as hatched and passed under the hen we intend to rear them, for when a hen once calls her brood from the nest she will seldom submit to be reset.

Many rear their chickens artificially after hatching them by the natural means, and make each hen set for six to nine weeks, and even for twelve weeks has a hen been induced to remain on the nest. Turkeys are easily taught to do the work of incubation; they are easily managed for that length of time. We think that even where artificial means are used no one should buy an incubator till they have first learned the lesson to rear artificially the chickens. This can be easily done by taking care of a season's flock hatched by hens, by the use of brooders, and buildings for their use, and as the broiler business commences in October one is ready for practical operation when chicken-hatching by natural means has closed.

We have known of instances where hundreds of chickens have been reared during a winter when the only brooding facilities afforded them consisted of several wooden boxes lined with flannel or woollen carpet or old buffalo skin, the boxes being placed near a stove at night and in severe weather. There are many farmers who rear all their spring chickens in this way, and some of them sell several hundred dollars' worth every year. There is absolutely no obstacle to the

successful prosecution of this work, provided always that the chickens are given the proper treatment. *If they have warmth, fresh air, cleanliness, freedom from vermin, gravelly sand to run on, a variety of food and a daily supply of either chopped grass, oats, cabbage or lettuce, they may be raised in any number desired.* These conditions are absolutely essential.

There can never be an artificial mother invented that will equal the mother hen, and when we consider the many failures of the hen to hatch her eggs in the early part of the season we can see of what value an incubator perfect in its work would be, for it makes every hen, inclined to sit, of far more than double her original value, for she can be furnished chicks to rear of double the number she would be able to hatch, and in cases of failure to hatch a full brood of twenty to thirty chicks can be supplied for her to rear. There is no artificial heat to compare with the breast and feathers of the hen. Yet the farmer's plan awakens an inventive genius for a brooder, and teaches us a lesson of not relying too much upon the brooder itself. We are aware that hens crush quite a percentage of the chickens in the nest. To obviate this all hens that have been sitting sixteen days on eggs can be relieved of them and the eggs placed in the incubator during the last three to five days of incubation, and that percentage saved, thus making a good incubator of far more value as an auxiliary with the hens in this important work of reproduction. Our plan for a chicken house is different from all others we have examined, and our brooders different. But Mr. Tribon, of Brockton, Mass., has the same thing, to all intents and purposes only he

uses a plain sheet of zinc instead of the water pans, relying on dry hot air, which we are not sure is just as well in the winter as to secure the moist heat over hot water, as per our plan of brooders.

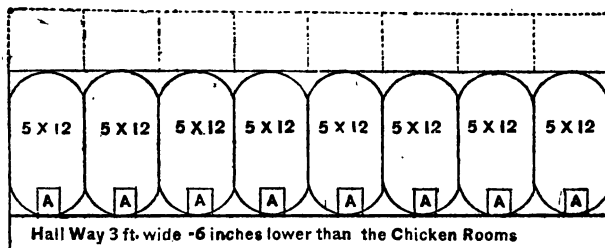


Fig. 2

GROUND PLAN FOR CHICKEN HOUSE.

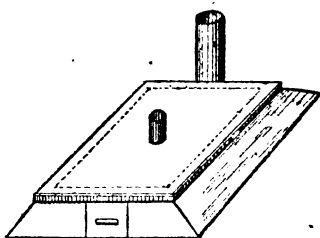


Fig. 3

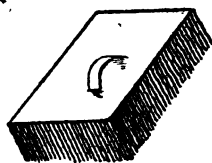
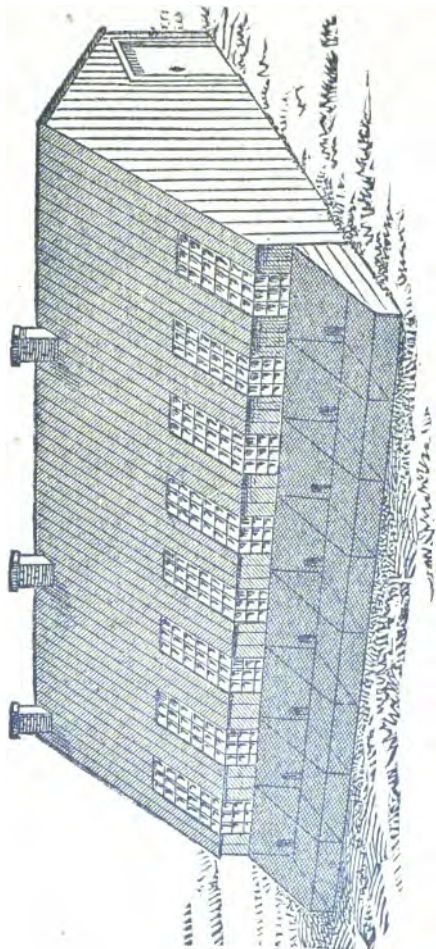


Fig. 4

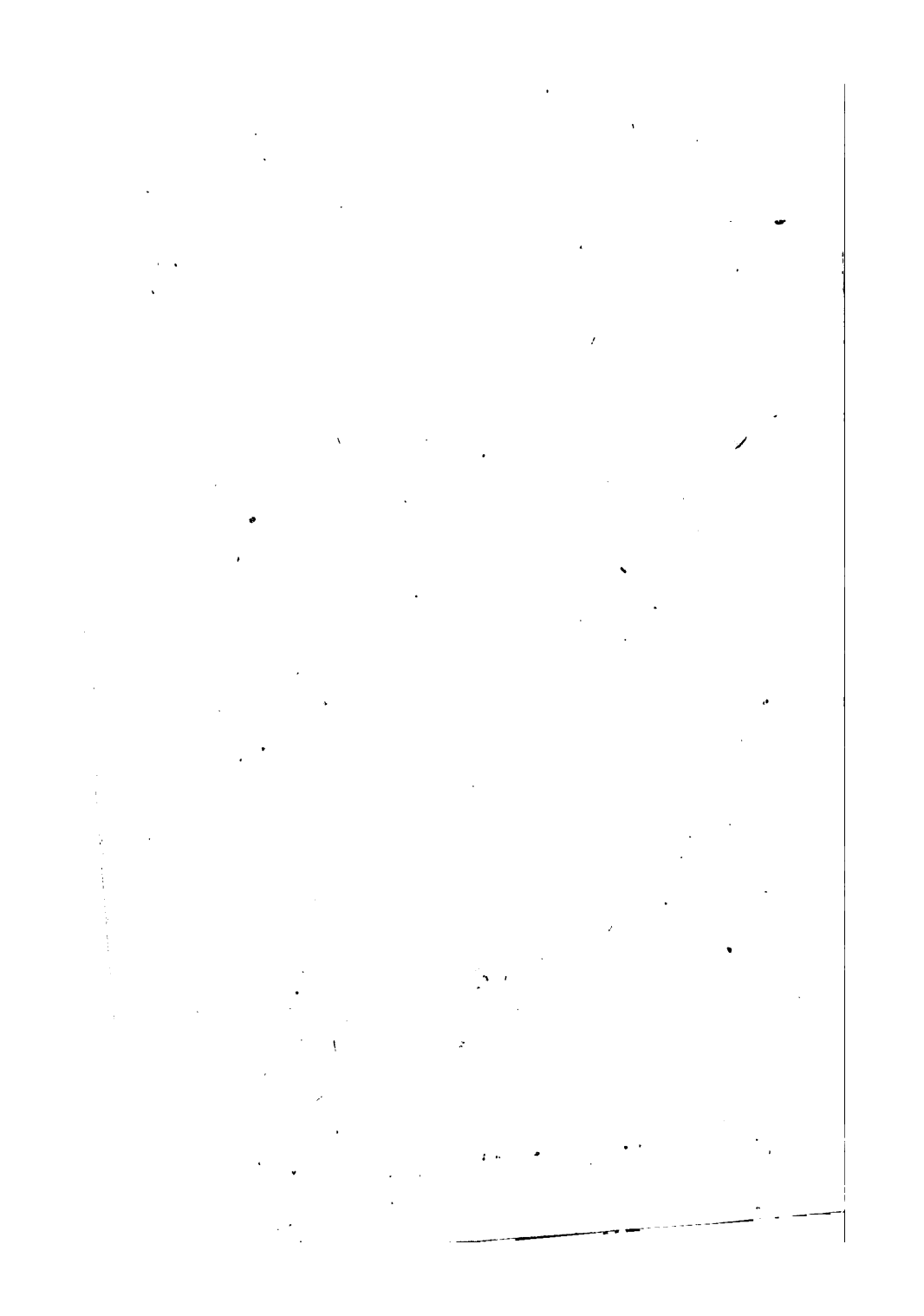
A BROODER.

Our chicken house is 15x40 feet in the main building, cut up into a hallway (see ground plan), 3x40 feet, and six inches lower than the chicken rooms, eight in number, matching the eight wire projections 5x4 in front to enable the chicks to take the air at will. They should be induced to take advantage of them by feed-



CHICKEN HOUSE. FIG. 1.

(Described on opposite page.)



ing them meat, exciting them to exercise while enjoying the tidbits of their noon meal. Each of the 5x12 foot rooms is furnished with a brooder (see Figs. 3 and 4), the base (Fig. 3) being made square in front with a door to admit the lamp, the two sides and rear end being cut mitering, so as to have a base nine inches high. On this base rests a galvanized iron pan three-fourths of an inch deep, the rear flange wide enough to let through a tube of tin one and one-half inches in diameter, that all smoke may escape from as well as give draft to the lamp. Above the flange of the pan (by which means it is held in its position) a strip one-half inch, or say three-fourths inches thick, and one inch wide is nailed, except on each side and end is left a gap of one inch, making an air-hole three-fourths by one inch (see Fig. 3.), and upon this rim rests the floor of the brooder one-half inch thick, thus leaving between the floor and the water in the pan an air-space one inch in height. In the center of brooder floor see tube two inches high and one and one-half inches in diameter that draws the hot air up from over the tank as it becomes warmed in its passage from the sides through the air-hole over the water, and it is radiated out over the chicks and escapes through the fringe of the brooder cover (Fig 4), the cover resting on the base (Fig. 3), as indicated by dotted lines. The brooder is heated by a kerosene lamp of the Diamond burner style. The base of brooder is 45x48 inches when it rests on the floor, and 30x36 on the floor of the brooder, the cover being 22x30 inches long. On a warm night the chicks will lay all round the cover on the rim of the floor outside, and for this reason we

make the cover smaller than the floor of the brooders. By our ground plan you see from the hallway these brooders (Fig. 2, A) are fitted into the chicken rooms so the floor of the brooder only rises two inches above the chick's earth floor; this gives them easy access to the brooder. This we believe the best and cheapest brooder one can build, except Mr. Tribon's, of Brockton, spoken of. In winter we see no reason why it would not work as well, and come a trifle cheaper.

These conveniences with the house is sufficient to rear four hundred chickens to four weeks old, when they can be removed to a house of like dimensions, which may be heated by a stove, and the chicks taught to go to roost on low roosts, as we do not believe in the use of the brooder more than four weeks. At the end of the four weeks in their second house they can be removed to the houses described before for growing stock and laying hens, with three houses like the one illustrated, using the brooder for four weeks in one only; one has accommodation for the growing of twelve hundred broilers all the time, as at twelve weeks the males are ready for market and the females should be taken to their laying quarters. Fifty are kept in a colony through all these stages of growth.

EVERY CORNER A DEATH TRAP.

Print this in large letters and post it up in every house used for chicken raising. For this reason we represent all the chicken rooms with rounded corners, made so by sheet tin or straw board or leather-board or tar felting. Let the circle be as large as the middle of a flour-barrel. Chickens will huddle in a corner, and a

corner is a dangerous place to be crowded into; being unable to liberate themselves they go down and under, being deprived of air, and many are trampled to death. The care to dispose of the corners in these rearing departments will save you many dollars in the course of a year.

These brooders will not do all the work alone. The house must be kept warm enough to keep the chickens from crowding the brooders. When the house is cool they will cling to the brooders. This cannot be a healthy condition of things. A stove will answer all purposes, for the brooders themselves will do much toward heating the house if the ventilation be properly cared for. The house should be ventilated from the hall-way, it being the lowest place; yet it should be furnished with ventilation at the roof in seasons of wet, cold weather, that all dampness from roof by frost may be carried off. Keep the house at fifty degrees six inches from the floor. This would be sixty-five to seventy degrees at the height of a man's head. Remember the chickens are compelled to stay on the floor. If this is done they will not use the brooders except as they come in from their outdoor noon runs and at night. Thus they escape the unhealthy conditions that follow huddling, which is increased by a cold house. Two houses such as we have described, with an incubator of five hundred and sixty egg capacity will enable a breeder to hatch and rear one hundred chickens a week. This will give him four weeks for each incubation, and only the hatching of about seventy-two per cent of reasonably fertile eggs—those that stand the tenth day test. This, it will be seen by

our experiment in the foregoing chapters, will be far below the work that others have accomplished, but a reasonable average and about that of the natural way experienced by the fowls themselves.

All this care you must learn by experience, and, as we have said, it will cost you less for this experience if you furnish yourself with all these conveniences before buying the incubator. This getting experience with large numbers of chickens before we know how to creep has driven three-fourths of all who have undertaken it out of the business, and poultry culture has been condemned by them when it was owing to their own incapacity or want of experience that led to failure.

My reader, if you have no money to put into the business, keep out of it, for poultry keeping is not a business to be run successfully without capital. When we say that poultry will pay the most for the amount of capital invested we do not mean it to be understood that you can make poultry pay with no capital. Constant watchfulness does the work. We have catered for fifty chickens in a brooder, because we think a woman can take care of twice if not three times as many as she can in larger broods, where five times that number run together. We believe also that the chickens will be larger. For the food consumed at the end of four months of age, if the increase of weight should be but one ounce each, how long will it take you to pay for the extra cost of building? Take your pencil and see what an item it will be to a man who rears but five thousand chickens a year. Three hundred and thirteen pounds of poultry meat per year will build quite a village of breeding-houses in the course of ten years.

CHAPTER VIII.

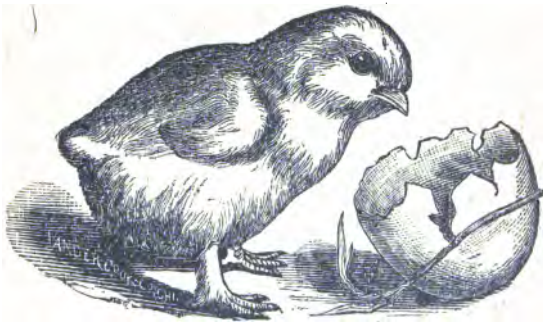
FEED AND CARE OF FOWLS.

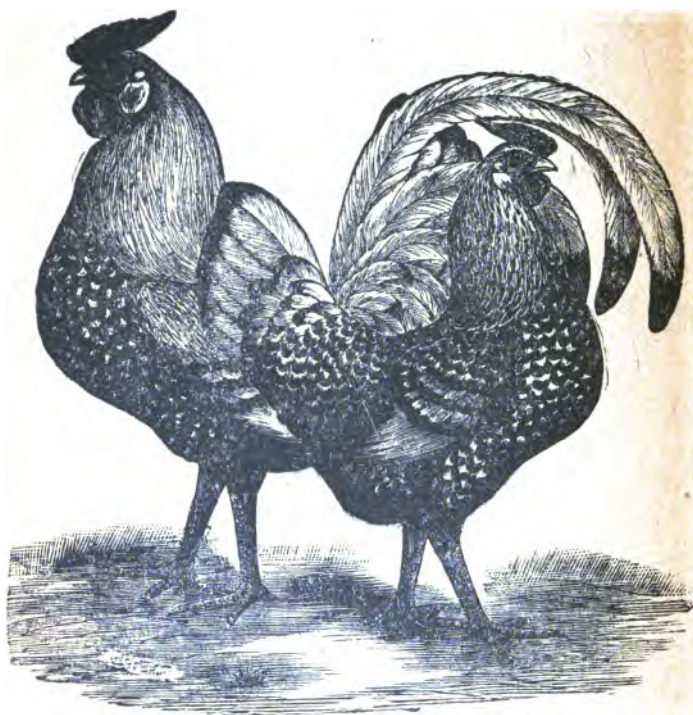
IN the closing of a previous chapter we left our reader with the chickens to be taken from the hatching quarters. But we go back a step to consider the feed and care of the fowls to produce the eggs in the shell fit for incubating. We have given you our plans for houses. The fowls who occupy them may be fed with boiled vegetables (purslane, cabbage, squash, seed-cucumbers or potatoes), mashed with wheat-bran and cornmeal while hot, feeding the same at the morning meals in such quantities as will be eaten up by nine o'clock, allowing the flock to forage till four or five o'clock, when a full feed of small grain and a small portion of corn may be given to them, adding to the morning meal fresh ground scraps or meat in some form, three days in each week. This will be found sufficient till the frost prevents the further growing of forage crops; then change the feed to what soft food they will eat up at the morning meal,—small grains, sunflower seed, etc., at noon, and what corn they will eat at evening. This will maintain the most even animal heat for the twenty-four hours; it being health and heat that produce the eggs, the hen being simply a machine which, if carefully run, must produce the egg or die. During the winter months, feed chopped cabbage and turnips,

and rowen hay. Rowen clover is an excellent substitute for grass, and is the only thing we can find that will produce eggs that will make the golden sponge-cake in winter.

It also preserves the plumage in all the brightness and beauty possible, and is a grand help toward preserving the vitality of the eggs for incubating purposes; nor must we forget to feed, during confinement, in the soft feed, as often as once each week, sulphur in doses of a dessertspoonful to ten hens. Pulverized charcoal will be found an excellent thing to occasionally feed with the soft food, or in a crushed form, for the fowls to go to at will,—charred grain being the very best form, but it is most expensive; corn, roasted like coffee, being a nice way to furnish it. In a nutshell, let the adults who are to produce the eggs we set be fed with vegetables, fish, flesh and grain daily, if convenient to do so. Let the vegetables be mashed with excelsior meal. To care for the flocks, to get the best eggs and the largest number, is really a science. When one keeps a large number it is an easy matter to have a "*fat hens' coop*," so-called. Eggs laid by an exceedingly fat hen seldom prove fertile. The keeper who is up to his business has two pens, which he calls the *lean quarters* and the *fat pen*. At night, as he goes his rounds, and feels of the birds to note their condition, he will notice one, it may be, or two—sometimes three, in a flock of twenty-five, that are excessively fat. These should be placed by themselves and fed with sulphur, wheat, bran and oats till reduced to a nice working order, when their eggs may be expected to hatch. Again, the keeper finds here and there a lean one; of

these he makes a pen, to which he feeds meal, corn and fat-producing food till he betters their condition, and thus he shows himself master of his business, and will find in the end the profits on the right side of the ledger. Ventilation, feed and flesh all in perfect order, and there will be no grumbling because the birds look shabby or that the eggs do not hatch.





SILVER-SPANGLED HAMBURGS.

CHAPTER IX.

FROM SHELL TO GRIDDLE.

IN treating this subject we have nothing new to offer beyond the experience of thirty years with the different breeds. We know that regularity in feeding, protection from storm and cold winds, warm, well ventilated quarters, and wholesome, sweet food, all these are essential to success in poultry raising. Exercise in the open air a part of each day is an absolute necessity. If engaged in rearing fowls artificially you cannot be told too often that the chickens must go out of doors, if but for ten minutes each and every day; that the houses must be kept warm enough to prevent their going to the brooder only as a child runs to the stove to warm as they come in from the sharp air of winter, or retire for the night. This, and the regular course of feeding which we now offer you in a bill of fare, is our course pursued from shell to griddle and the spit.

BILL OF FARE.

The first meal for chickens after being taken from the nest should be boiled eggs, chopped fine, shells and all, also baked corn cake or excelsior meal cake crumbled into scalded milk; no fluid as drink but the scalded milk. After the first twenty-four hours, after

their gizzards have become filled with egg-shell, gravel, etc., let their meal in the early morning be excelsior meal, bread and scalded milk; at ten o'clock granulated corn; at two o'clock the excelsior, bread and milk, and at six o'clock canary seed, millet seed, and granulated corn. This if the hen be confined and the chickens have their liberty to find grass and insect food. Thus feed till two weeks old, when it will be found that few or any deaths will have occurred, and the chickens started well for rapid and vigorous growth. If the season be winter and we are raising them by artificial means—by brooders—and all food furnished to them in confined quarters, like those described in our chicken house and its brooders, we would have a rule by which the attendant should feed them each and every day, to-wit: after they were two weeks old, adding to the above mode of feeding till two weeks old, boiled beef or sheep's haslets, chopped fine, one meal per day; also green oats raised in frames at the windows, cut fine. To take its place when short of the green oats, steamed rowen clover, chopped fine; this, with the use of boiled fish, would supply the place of the green grass and such food natural for them in summer, without which chickens cannot be reared. They must have vegetables, meat and grain, and have them every day, if good results are to follow. Chickens at two weeks old, thus started for us, we would continue the bill of fare, to-wit:

MONDAY.

BREAKFAST.—Excelsior meal, bread and milk.

TEN O'CLOCK MEAL.—Boiled meat, chopped fine, with steamed clover.

TWO O'CLOCK DINNER.—Excelsior meal, bread and milk.

SUPPER.—Granulated corn, oats and barley.

TUESDAY.

BREAKFAST.—The broth in which meat was boiled, thickened while it was boiling (and when the meat was taken out) with excelsior meal.

TEN O'CLOCK.—Chopped mangel wurzel beets, and after eating what they would, allow to finish filling their crops with granulated corn.

TWO O'CLOCK DINNER.—The balance of the broth, mush and a pan of sour milk, if to be had, to pick at till five or six o'clock.

SUPPER.—All the granulated corn, oats and wheat they would eat should be given.

WEDNESDAY.

BREAKFAST.—Fish chowder made palatable with salt and pepper, boiled potatoes, and thickened with cornmeal and shorts.

TEN O'CLOCK.—Oats and wheat, and all the steamed clover or green chopped oats they would eat.

DINNER.—Cracked corn and balance of the chowder if not wholly disposed of at the morning meal.

SUPPER.—Cracked corn and barley.

THURSDAY.

BREAKFAST.—Chopped sheeps' haslets and warm mush of wheat, bran and cornmeal.

TEN O'CLOCK.—Cracked corn and wheat.

DINNER.—All the steamed clover they would eat, and as dessert what excelsior meal cake they would dispose of.

SUPPER.—Cracked corn and oats. Give sour milk in a pan to go to at will.

FRIDAY.

BREAKFAST.—The meat soup thickened with excelsior meal.

TEN O'CLOCK.—Green oats, chopped onions and light feed of granulated corn.

DINNER.—Balance of the broth, mush and barley to finish up.

SUPPER.—Cracked corn and wheat.

SATURDAY.

BREAKFAST.—Raw chopped meat and excelsior meal mush, scalded and fed warm.

TEN O'CLOCK.—Chopped cabbage, lettuce and turnips, or mangel wurzels, throwing then a little granulated corn.

DINNER.—Excelsior mush with barley.

SUPPER.—Granulated corn and oats.

SUNDAY.

BREAKFAST.—Fish chowder, warm (made as above).

TEN O'CLOCK.—Steamed rowen clover and barley.

DINNER.—Excelsior meal cake and scalded milk.

SUPPER.—Cracked corn and wheat with sour milk *ad libitum*.

It is not absolutely necessary to bake excelsior for them after the chickens are two weeks old. It may be

scalded, but we think it pays to bake it. We make the excelsior meal by grinding into a fine meal in the following proportions: twenty pounds of corn, fifteen pounds of oats, ten pounds of barley, ten pounds of wheat bran. We make the cakes by taking one quart of sour milk or buttermilk, adding a little salt and molasses, one quart of water in which a large heaping teaspoonful of saleratus has been dissolved, then thicken all with the excelsior meal to a little thicker batter than your wife does for corn cakes. Then bake in shallow pans till thoroughly cooked. We believe a well appointed kitchen and brick oven pays, and in the baking of this food enough for a week can be cooked at a time. Our brick oven should be heated once a week, when the sheep's pellets could be baked so they will chop easily on baking day: but if steam boilers are used the food can all be steamed easier. Granulated corn we secure by first grinding the corn into a coarse meal and bolting out the flour that comes from the chit, so-called, or endosperm. Oat groats or steamed oats may be fed dry; this is expensive, but during the first two weeks will be a very nice food for them. After continuing the bill of fare described from two weeks till eight weeks old, the chickens can be taken to the fowl quarters, and enter on three meals per day, which can be what any grown fowl would eat. But vegetable food and meat food must be regularly given, for so long as muscle and bone are growing we must cater for them and furnish muscle and bone-growing material.

CORN furnishes eleven per cent only of muscle and one per cent of bone.

WHEAT, 15 per cent of muscle, 1 per cent of bone.

BARLEY, 17 per cent muscle, 2 per cent bone.

OATS, 22 per cent muscle, 3 per cent bone.

BEANS, 22 per cent muscle, no bone but rich in nerve tissue.

Thus we have in the excelsior meal feed 17 per cent of muscle-growing material and $1\frac{7}{8}$ per cent of bone-growing substance. This excelsior meal feed has the praise of all who have used it, and when we assert that hens lay 20 per cent more eggs, and that Asiatics will weigh one pound more at twelve weeks old by its use in baked cakes and scalded milk, we but state a fact that can be vouched for. But we are asked: Why be at the trouble of making this meal when we can feed these different grains from day to day? We answer by saying, You will not take the pains to feed them every day, and in the proportion named. We all know that in plant life it is necessary for thrift and growth and a full crop that the ground in which it is planted must contain the constituents that go to make up the plant we would raise; that if but one of the ingredients be wanting that growth ceases,—so it is in this excelsior meal. The fact that more eggs are secured and larger chickens grown by its use, over the old farm way of raising them, should be the one fact to secure its use. Let the gain be but two ounces each on five thousand chickens in a year and we have six hundred and sixty-six pounds of broilers, which, at forty cents per pound, gives us the net sum of \$266.40, which will pay pretty well for making what bread we feed to them before they are twelve weeks old.

Again, we cook the food and it is kept sweet until

eaten up. No sour pans and fermenting food lying about. The old water-and-meal dough that in one hour in the sun commences to ferment, the old boards and ground, sour as can be, the continued eating of this sour mixture off the sour boards and ground, disturbed state of the bowels, acrid discharges, diarrhœa, and death, are all prevented and a rapid growth instead secured, because the chickens are healthy and the pullets raised to lay earlier in life, and to be better layers through life for your trouble. Is the picture overdrawn? Try the excelsior meal, and if we have made a mistake, notify us. We are aware that seed food is the natural food for fowls, and for this reason we recommend the granulated corn, for it can be fed dry with the millet and canary seed to fill their crops at night, as we give the adults corn and grain to retire on, and substituting the larger grains as they grow to be able to swallow and masticate them. We are sensible that raw meat can be fed in such quantities as to be unwholesome for them. At liberty in the summer time they secure all that is necessary till frost comes and closes the earth and prevents the earthworms coming to the surface, and cuts off the insect supply, when we must furnish it to them in the shape of flesh and fish in a reasonable supply. We have tried to designate what that should be in our bill of fare.

In keeping large numbers of fowls it is easy to cater as indicated in the foregoing. Milk is a whole food in itself, and where one lives near a creamery skim milk and buttermilk can be had at from eight to fourteen cents per can. We would keep it on hand for daily use even at the highest price named.

As soon as the males are large enough to weigh three pounds to the pair take them to suitable fattening pens, furnished with clean gravel, and feed four times a day on corn and barley-meal and pork scraps scalded together, also corn and barley whole, with crushed charcoal in a box, that they may help themselves; give one feed a day of chopped celery and whole corn; darken this coop for two hours after feeding. In ten to fourteen days they will be plump and weigh four pounds to the pair, and be appreciated by our seaside epicures.

If we are to make roasters of them, if Plymouth Rock, grow to five months old, if Brahma, to six and a half months old, then shut them up for a two weeks' fattening process, as spoken of above, when they will be surely first-class roasters.

As the pullets are to be kept for egg producers, a different course should be pursued. We believe first in selecting the best layers as stock birds; we also believe they can be reared to be better layers by feeding almost wholly muscle and bone material, and avoiding all fat-producing food. When eight weeks old let them have all the exercise they can be induced to take; let their food be milk, wheat, flesh, fish, and constant supply of green vegetable food, and you will find they will commence earlier to lay and be the better and more prolific egg-machines, for you built them into such a structure. Note the difference in the number of eggs laid by such a flock as compared with the pullets bred haphazard, and who have roughed it for an existence up to six months old.

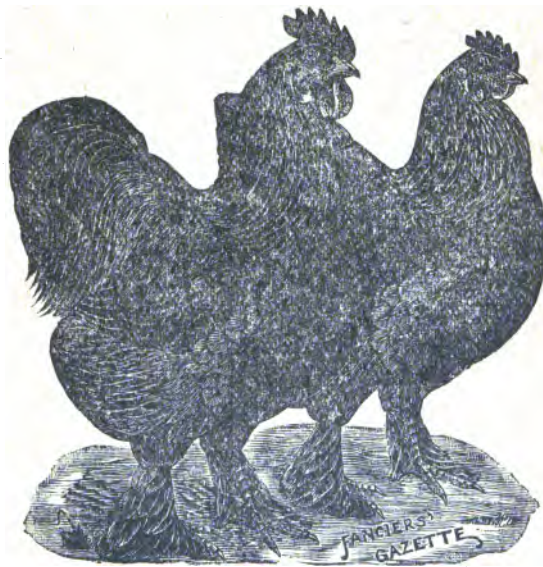
Through all this course see to it that all drinking-

pans are kept clean and that the water be changed at the very least once each day. We believe it will pay you to do it twice, morning and at four o'clock. Roup of itself is not contagious, only as through the drinking vessels. It is therefore advisable to have a hospital, to which remove all ailing stock. If you do not care to doctor them, kill all sick and ailing specimens on their discovery. When the chickens reach an age from sixteen to twenty-six weeks old,—classing the breed, to wit: the Leghorns and other small breed, sixteen to twenty weeks; Plymouth Rock and other middle size fowls at eighteen to twenty-four weeks, and Asiatics at twenty-six weeks old,—they will be seen to be dropping their hackle and tail feathers. At this indication be on the look out for what we term distemper, which seems as sure to come as measles with children. They show very red in face and comb, they act in a listless manner, showing a disposition to sit on the roost or ground, and move exceedingly slow. As this falling of feathers becomes apparent, put at the ratio of two grains of bromide of potassium in the water they would naturally drink in a day, every other day for a fortnight, when the trouble will be disposed of, many being prevented from having it at all, others having it lightly. The disease is generally followed by thirst, which may be adjusted by a dose of from one and a-half to three grains, as the thirst compels or induces them to drink. They generally eat but little while the trouble lasts, which will be about three days, when they return to their food and all is over. Bad cases, where the face swells and the nostrils run, will make it necessary to inject into them by the aid of a crown

bottom oil filler, kerosene oil, and the throat should be gargled with the same, when it will be found all that is necessary to ward off the roup in nineteen cases in twenty, and then the twentieth case can be removed as recommended in roup.

While our bill of fare and care for chickens from shell to griddle will apply to both the natural and artificial rearing of them, many of my readers will care only to raise them to supply home consumption, and perhaps some few early chickens that they may show them at their fall fairs. Let this be as it may, it is never advisable to hatch them till they will be able to have quarters on the ground, when they will get the young grass by the time they are four weeks old, for they will certainly have rheumatism and prove worthless. If you hatch them earlier than this you must sow frames of oats in your kitchen windows, if you have no hot-house, that the green oats may be had for them each day as a substitute for the grass. These frames, set upon the stove and warmed through, will increase the growth of the oats, and a frame 20x30 inches will raise oats enough for a brood till the grass comes in the spring. We are too many times apt to believe we can get along without this green food, or a substitute. But to make sure of success, one should have an acre or so of clover, which can be cut three times by cutting when, say, six to eight inches high, just before it blossoms—left to wilt in the sun and finished drying in the barn lofts. In this way secure a sufficient crop to make it serve you till you have enough for the uses heretofore described. To enable your customer for your egg to make the golden-colored

custard will be an inducement for them to remain your customers; and remember this clover alone will do this, fed to hens in winter. Again, be sure of this crop.



BLACK COCHINS.

CHAPTER X.

ARTIFICIAL INCUBATION.

TO say that the capabilities of poultry husbandry have not been even dreamed of, could the artificial hatching and raising of the chickens for broilers be demonstrated as practical, none will deny. There is actually no limit to the industry. Until 1884 no one can claim the artificial plan as having proved a success. The ever-increasing demand of our city hotels and restaurants, the rich families, and continual increase in our summer resorts, has proved immense, and the demand of the future for broilers, who shall estimate what it will be? But whoever has seen a demand in the country that did not create a supply? There is no other resource than that artificial incubation and rearing of the chickens must meet this demand. The question is asked almost daily, "Is there an incubator that is reliable in the hands of common people?" We answer that in the hands of seventy-five per cent of the human race, No. Is there an incubator that a man or woman can be taught to run successfully? We answer, Yes. And here is the first lesson to be taught, that ordinary women and children cannot run incubators. All the incubator makers up to one year ago have asserted that "any woman or child can run it." They

have deserved defeat, and their incubator has been worthy only of condemnation. It has been the rock on which their enterprise has failed. We believe there are incubators that can be run by intelligent men and women, but there are none that can be run successfully by people who have not come to the age of judgment, for it is safe to say not one incubator in forty that have been purchased has been run the second season. And there is not an incubator put upon the market that can be run successfully by the printed rules sent out with it. We made this assertion to one of the most successful incubator manufacturers, and it was not disputed. The assertion is far from being a bold one, when made against the incubators collectively. Yet we believe "The Year" and the "Machine" have come when we may be said to be looking upon the dawn of practical artificial poultry culture. Let the incubator be what make it may, the operator must love the work, learn every piece and adaptability of its mechanism. He may with profit be well schooled in embryology, the influence of the atmosphere upon the eggs and its work in connection with evaporation, the humidity of the heat, the growth and increase of animal heat engendered in the shells in conjunction with the temperature surrounding the machine externally, the regulation of the heat applied by the lamps or stoves. There is not one of them all that does not fluctuate very much, and each hour has to be watched and provided for. The attendant alone is responsible for all this. No child can do this, and not five per cent of the business men and acknowledged smart women we meet can do it. When the attendant becomes an expert he so

controls, as many have become able to do, these influences by the sense of feeling, to wit: putting his hand into the incubator and judging by the feeling, and not by looking at the thermometer, having become so to speak a living thermometer. Then the machine is safe in such hands; such persons can be said to be masters of the situation. Eternal vigilance has been the price paid for this knowledge. With such intelligence to control them may it be said that we have in this year of our Lord, 1885, incubators that contain within themselves the conditions nature furnishes for hatching eggs. The egg is one of the most beautiful of creations; yet how much depends upon the condition and care of the hen that laid it whether it ever becomes a chicken.

To the careless observer it consists of but two elements within the shell, the yolk and the surrounding albumen. Yet the careful student finds within these a multiplicity of features and conditions quite beyond the vision of the ordinary experimenter.

Now to study an egg requires a trained hand and eye. It also requires in the student a knowledge of anatomy, and a skillful manipulation of the microscope.

As the embryo chicken advances in growth and perfection, it is necessary that every phase and requirement of its embryohood should be studied and understood.

Professors Huxley, Agassiz, Foster, Balfour, Bischoff, Dollinger and Karl Ernst Von Baer, have devoted years to the study of the egg, and to their scientific labors we owe most of our knowledge of embryology.

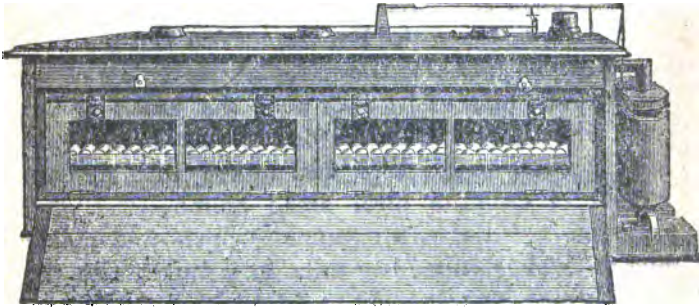
Their studies were confined entirely to the physiological life of the chick, and none of them pursued their labors to a utilitarian end; that is, they worked as scientists, not as inventors. Yet all knowledge possible does not come amiss.

The greatest source of failure has been the endeavor to make them self-regulating. Electricity has proved too delicate, and therefore too treacherous a means, and the temperature has fluctuated. Under the hen 105 is the extreme the eggs can reach; and experience has shown that if incubators run above 106 during incubation there will be a corresponding mortality; that if the temperature goes to 115 degrees it may not decrease the number hatched, yet it will cause a mortality among the chickens from twenty-five to sixty per cent. When the machines run evenly, never below 99 or above 105, or in the use of incubator thermometers the heat be maintained at 103 to 106 (they being gauged three degrees high), then the mortality would not be beyond three per cent over those hatched by the mother hen, and, the same care exercised in the rearing of them, one would have to be a keen observer to see any difference between the incubator and naturally hatched one. It is fair also to say, when the machine is allowed to run so high that a certain per cent in increase in mortality is discernible, that the chickens that live are impaired in a like ratio as compared to those hatched and raised in the old way.

As these chickens advance in the embryotic life they engender animal heat. This increases each day from the tenth to the twenty-first, when they break the shell. This demands the attention of the man in

charge, and a constant change in the means of regulating the incubator, and should be attended to every sixteen hours, to say the least. Then how foolish it is to say a machine can run alone. An incubator that hatched its chickens at 105 degrees, the moment the chickens are removed from it the temperature runs down to 92. This shows that the chicks themselves influence the heat twelve to thirteen degrees, and a machine left to run itself would, when taking into it the same amount of air, reach 117 degrees. If the regulator prevented it by a larger amount of air admitted, the moisture in the machine would become exhausted, and the chickens dry in the shell and fail to hatch at all. It is as the operator becomes an expert and able to control all these complications that he or she becomes valuable; and the day is not far distant when such experts will command from \$1,000 to \$3,000 a year, for the poultry men have paid out all the money they propose to for crude help on incubators; and the incubator that in the hands of even these experts will hatch even ten per cent more than its competitors will be the one to be used to the exclusion of all others. We have been slow to recommend any particular incubator, but for practical use the production of broilers in April to September 1st makes incubators a necessity. The eggs must be hatched at a time of year from November to March, when hens *will not sit*. We kick against the pricks no longer, and say the time has come for a reliable incubator, and experts in the form of intelligent women to run them and to care for the chickens hatched by them. Women, when interested in the work, are better than men. We have tried to show

you the danger of crowding by the young chickens, but ducks can be raised artificially with far less danger in this respect. They can be grown in larger numbers on the same ground and in flocks of from two to three hundred with less danger of death by suffocation. The best duck record we have any knowledge of was by the use of the Monarch incubator, March 1, 1885. One tray was filled with duck eggs; when tested it gave sixty-seven fertile eggs, of which sixty-five hatched. May 16th, two trays were filled with duck eggs and put in another



MONARCH INCUBATOR.

Monarch machine; 168 eggs proved fertile, and 164 eggs gave us ducks. At the next trial the whole incubator was used, and from the 379 fertile eggs 362 ducklings came forth. It then being too late for broilers the machines were used (four of them) solely for duck eggs as fast as thirty-five ducks could furnish them, till at the present writing 3,000 ducklings can be seen upon this farm of James Rankin. Up to the time 1,800 were hatched, the oldest being but ten weeks old, only three ducklings had died from any cause whatever. At this time the oldest were being marketed and

weighing from near eight to eleven pounds to the pair. The growth was surprising. The last hatch was July 10, when 260 ducklings were hatched from 278 fertile eggs. Thus has the percentage been from ninety-two to as high as ninety-seven per cent of the fertile duck eggs.

These green ducks, as they are called, started off at \$3.00 a pair in June, selling now (July 17) at \$2.00 a pair. In the meantime we have been marketing eighty pair a week, the average age being nine weeks old and average price up to present writing being about \$2.40 per pair, and their cost twenty-six cents per head. Quite a profit for a four-months' business. You can put these young ducks into the brooding houses in lots of one hundred and fifty each; they need the brooders only about ten days. Their first food should be the boiled infertile eggs, boiled hard and mixed with an equal amount of excelsior meal bread crumbs—the whole peppered a little with cayenne pepper—and scalded milk to drink, putting the milk in a fountain so they can only put in their beaks to drink; after the first two or three days the baked excelsior meal bread and milk can be abandoned, and cornmeal, two parts, oatmeal, one part, and wheat bran, one part, with seven to ten per cent ground beef scraps, scalded and let soak six to twelve hours. This whole mixture can be scalded or mixed with skim milk. Feed for first four weeks five times per day—three times per day afterward—boiled potatoes or other vegetables mashed with ground meal and scraps. Ducklings need more meat and vegetables than do chickens. When fattening them use milk for drink and celery chopped fine for the last week if you wish to give them the wild celery flavor of the wild mallard.

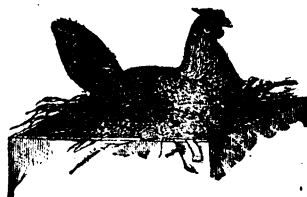
The Pekin duck was used in the foregoing experiment. During all this time these young ducks have had only water to drink given to them in fountain drinking vessels in which they could only put their beak. The very young duck should be confined in grass runs say 20x150 feet. When six weeks old they may have a field large enough to keep green. They graze like cattle, and grass and vegetables, must be furnished them constantly.

Mr. Buffington, on seeing the success above stated, put 400 eggs into his Monarch incubator. How many infertile eggs were taken out on testing day we did not learn, but 323 ducks were hatched and doing well. We say so far as ducks are concerned artificial hatching and rearing is a success, and their growth rapid and the ducklings larger than those hatched and left to the natural care of mother ducks. That chickens are being raised for broilers successfully we are compelled to acknowledge, and we say that while heretofore we have been no friend of or believer in incubators we wish to be understood that at least we are no longer prejudiced, and believe in the possibility that with experts to run them they are the only means by which the broiler business can be carried on successfully. We have cited the use of the Monarch incubator for the reason that the foregoing has been achieved by it and we believe it less complicated and easier regulated and a safe machine in the hands of people of general intelligence. Other incubators are successful, but not being personally acquainted with or knowing of experiments resulting from them we speak only of this one.

We give this experiment in duck raising for the

reason that it is new, and a means whereby the fast decline in the wild duck and game supply of the country in our opinion is to become a substitute. The past season thousands of these green ducklings, celery and milk and barley fattened, have caused the lips of many an epicure to smack, with the accompanying assertion that they gave unmistakable evidence of their feeding upon young wild celery. The fact is, these ducklings so raised and nicely cooked are the best meat that wears feathers, and he who has never eaten one so reared and fattened has yet to learn what is the finest of all poultry.

To treat of the subject of artificial incubation in an exhaustive manner was not our intention. The care of chickens artificially we have dealt with in a previous chapter, and have expressed all that need be said. The use of incubators from October to March 1st for chickens as broilers, and their use for green ducks from March to July, seems to double the poulterer's time and facilities in their use. May the years to come be as fruitful of improvement as have the last three in this direction, and poultry culture will maintain its supremacy as an agricultural industry.



CHAPTER XI.

DISEASES OF FOWLS.

THEIR MEDICAL TREATMENT.

WE shrink from writing upon this subject, for we are not an M.D., and we only give our views upon and treatment of a few of the most fatal diseases that we have had occasion to deal with.

We believe in prevention, and when fowls are sick, in extermination, more than in doctoring. When fowls have their liberty they are seldom ill, and when they are confined, if we are careful to furnish a good supply of vegetable food, health generally attends them.

In most of the fatal diseases there is a poisonous fungus growth in the blood. Fowls never perspire, and the heart beats one hundred and fifty times per minute. The evils that are easily thrown off by perspiration with them have to be exhaled by respiration, and as a result we find the seat of nearly all the fatal diseases to be in the head, throat and lungs. Rapid respiration and circulation therefore become necessary to expel the vapory excretions.

The chanticleer of the farm-yard whose liberty is not proscribed will have a battle every week and not seem the worse for it, while in a similar instance one kept in

a poorly ventilated house, and fed upon unwholesome food, will suffer from inflammation and canker, and in very many cases death will follow. And why? Because the blood is poor and even poisoned, and unable to do the work of repairing the damage until it has thrown off the poison from which it is suffering. The former, rich in a healthy circulation, commences the work of recuperation the moment the wounds of the battle stop bleeding.

We are all aware that iron is one of the very best of blood tonics, and if we but observe we shall see that fowls kept upon an iron and sulphur charged soil are generally more healthy and show better luster in their plumage than those kept upon a dry and arid plain. The reason is that the vegetable growth is but the embodiment of the soils, one furnishing rich iron and sulphur deposits, the other destitute of them.

The breeder, if he would be successful, will do well to consider his location and furnish artificially that which is lacking in his soil. "From dust to dust" is true of all things, and it behooves us to see of what kind of dust we build our chickens.

The best doctors are those who watch the patient while well, and prevent sickness, instead of waiting for symptoms and then doctoring them (the expectant plan, so called), and finds his remedies in the regulation of the diet.

So the breeder best takes care of his flock who keeps a watchful eye upon them while at roost. If the droppings from it show a costive tendency then feed freely of vegetables, such as boiled potatoes, turnips, or cabbage mashed with bran and meal while hot. If

the droppings show a relaxed tendency, then cease giving vegetables, and resort to baked johnny-cake, corn, and tincture of iron. Sour or sweet milk is one of the best things to feed poultry at all times. Fowls thus carefully fed are seldom sick, unless it be that they have what we term the "distemper."

DISTEMPER.

This disease all chickens are heir to, and it generally takes them about the time they are from twenty-two to twenty-six weeks old, and at the time they are shedding their second chicken feathers, preparatory to putting on their freedom suits, so to speak.

If carefully watched little or no medicine is needed, and so light is the disease that it hardly deserves a place in this catalogue, yet if not jealously watched it becomes the most fruitful in the introduction of roup and consumption.

Symptoms.—A listless, quiet mien, a disposition to remain on the roost in the day-time, face and comb quite red, and a puff or fullness of the face under the eye. The second day a white froth is discernible in the corner of the eye. A decided loss of appetite is also noticeable.

Treatment.—If noticed, and the disease taken in hand before the appearance of the froth in the eye, it will usually only be necessary to wash the head and beak clean, and blow down through the nose into the throat either with the mouth or by means of a rubber nipple, thus clearing the tear tube, and bathe the head and wash the throat with a solution of carbolic acid—one part acid to ten parts water. The birds should be

kept in a quiet place and allowed nothing but water, in which place three grains of bromide of potassium per day. The best way to administer it, if the fowl will drink of its own accord, is to apportion its water to what it will take in the day. In this way they take it homœopathically. But if dumpish—neither eating nor drinking of their own volition—then administer the dose in a pill of soft bread, inject, by means of a crown bottom oil dripper, kerosene oil into the nostrils. A still better way is by the use of a crooked nozzle rubber syringe, placing the point in the cleft of the roof of the mouth and syringe the nasal passage clear, when the action of the oil will be to allay the inflammation. One treatment is sufficient in three-fourths of the cases. It seems to run about three days, when they regain their usual appearance of health, many have it so light as not to be noticed. In aggravated cases, where the face is swollen and eyes become watery from the closing by inflammation of the tear tubes, the head and throat should be thoroughly steamed by the use of a large sponge and hot water. The tear tube should be cleared (as before explained), a dessertspoonful of castor oil given, and the bathing of the face and throat with the solution of carbolic acid continued at short intervals.

This distemper may be called a cold or the incipient stages of the roup. We will not quarrel about names, but simply say that in our opinion it is no more roup than a cold is measles. There is no offensive smell to the breath as in roup, but if neglected it will excite roup. We have not the slightest doubt of this; in fact, know it to be the case, and the breeder has the

choice of adopting the adage, "A stitch in time saves nine," and attending to this mild, easily-managed distemper, or to neglect it and have that scourge of a poultry house—THE ROUP—to contend with.

ROUP.

When roup appears our advice is to kill the affected one and turn your attention at once to the flock, giving sulphur in the ratio of a tablespoonful to fifteen fowls every other day for a week, feeding tincture of iron, eight drops to a hen every day in their soft food, which will pay to be boiled rice, until treatment is over. With this be sure that the ventilation is complete and free from direct drafts upon the fowls. For the benefit of those who wish to cure the disease we give the following symptoms and our method of treatment:

Symptoms.—Swelling of the head, watery discharges from the eyes and nostrils, which are very fetid and offensive to the smell, following which these discharges become acrid and result in a congealed yellow coating to the mouth and tongue, called canker—which we term a poisonous fungus growth in the blood.

Treatment.—Wash and steam the head and throat with hot water in which a dash of carbolic acid is added. Clear the nasal passage to throat by an injection of carbolic water, one part carbolic acid to ten parts of water, or by the use of kerosene oil and the crooked syringe, as spoken of in distemper. Gargle the throat with kerosene oil three mornings running, when all the canker of throat and mouth will generally cleave off, leaving the mouth and throat red but clean.

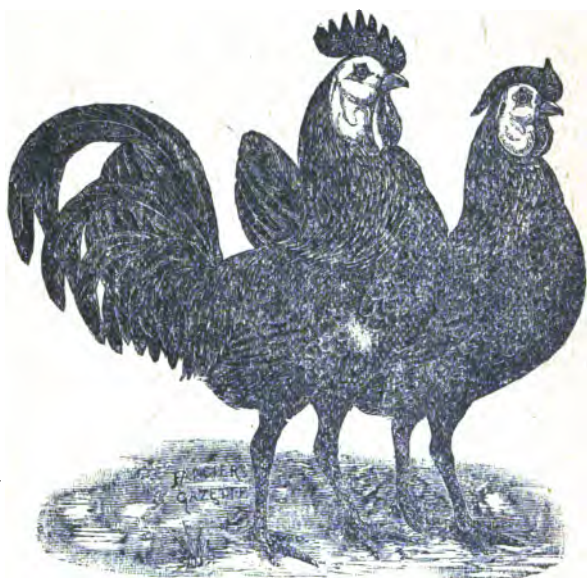
We have seen cruel though ignorant people remove this canker of the mouth with a stick or nail. All this kind of treatment but aggravates the disease. Give a dessertspoonful of castor oil, and follow with a gill of milk in which two grains of bromide of potassium has been dissolved, night and morning.

The milk can be easily administered by taking the bird by the under beak and drawing the neck upward till straight, when the milk poured from a tea-pot will run into the crop without the effort of swallowing.

At the end of about four or five days the effect of the bromide in the blood, and the solution of carbolic acid as a bath, and the kerosene as a gargle, may be seen in the sloughing off of the cankerous substance from the tongue and mouth, when the fowl will commence to mend. The treatment at this stage should be nourishing food, with occasional doses of sulphur, and the fowls will regain their health and sprightliness. In some cases the bromide seems to fail in overcoming the poison in the blood. We have used Fowler's solution, one drop a day, and in a week seen the birds commence to mend, but when the disease hangs on for a long time we think it poor policy to breed from such, for we find such birds susceptible to colds. They have become so debilitated that their recuperation, and the watching for a long time before they will lay, makes the hatchet a better means of eradicating the disease in those isolated cases.

CHICKEN POX (OR "DRY ROUP").

Symptoms.—An eruption of the comb, face and wattles, raised and warty in appearance, and in color a



WHITE FACE BLACK SPANISH.

yellowish white. When the crests are removed, these warty substances resemble a bunch of tiny spiles set into the flesh. They bleed profusely.

Treatment.—Remove the birds from the flock, and touch the crowns of their pustules with citric ointment and allow them to dry down to a black scab, which will be ripe in about seventy-two hours, when, if lifted off, will take with it the little white roots of the disease, from one-sixteenth to one-eighth of an inch in length. Give each morning for four days a pill made as follows: Tablespoonful of common flour, tablespoonful of flour of sulphur, twenty grains cayenne pepper, twenty-five to twenty-eight drops "Fowler's solution." (If the Fowler's solution cannot be had, use sixty grains of bromide of potassium instead.) Mix with cream, and make into twenty pills.

Dissolve four grains of quinine in half a pint of milk, giving half in the morning and half at evening; feed while treating, boiled onions mashed with oatmeal and boiled rice. If the disease attacks the eyes so as to close them and prevent their eating make the food into pellets half the size of one's little finger, which, if dipped in milk and the bird held as described in roup, will slip down the throat readily.

If the sulphur acts too powerfully upon the bowels scald the milk given, which will check its influence on the bowels and cause it to work more strongly in the blood. The disease is so like the "yaws," described by Dr. Quinn, we are of the opinion that it is a kindred one, if not the same.

Roup sometimes accompanies it, but they are not alike. This has a run, and requires from five to seven

days to treat it. We tried specimens of a strong constitution by giving milk and water, and without treatment, which recovered. It is very contagious, and on its first appearance kill the specimen afflicted, and by the use of vegetables, sulphur and iron treat your flock to check its spreading. Cleanse the house in which the disease appears as thoroughly as you would a house that had been visited by small-pox. It is, like that, a cutaneous disease.

DIPHTHERIA.

We give to this new and very fatal disease the above name on account of its symptoms.

Symptoms.—The face and throat become exceedingly red and inflamed; so much so, that if cold water is applied it will evaporate in steam on account of the heat produced by the inflammation. Six hours after this feverish appearance in the throat and face the throat becomes coated with a yellowish leathery lining, which may be removed by putting down the throat a compressed sponge, liberating it and withdrawing it, when it will take up the coating, leaving the surface of the throat a whitish red, thickly studded with minute raw spots from which this poison fungus growth seems to exude.

If the throat be left without sponging out more than six hours the coating will adhere to the throat in the same manner as the canker does in roup.

Diarrhœa attends the disease, the discharges resembling a mixture of oil, snuff and chrome green paint.

Exhaustion is very great, so much so that we have given a cock of twelve pounds weight two ounces of

brandy with two ounces of milk in the morning and he showed no evidence of intoxication whatever.

Treatment.—Steam the head and throat with hot water to which a little carbolic acid has been added, and sponge the throat as described in roup, also gargle the throat with kerosene oil, or still better, the following recipe: Sulpho carbolate soda, sixty grains; glycerine, cinnamon water, of each two tablespoonfuls. Give a small teaspoonful three times daily, and gargle the throat as above with a teaspoonful of the following mixture in a half glass of water:

R—Saturated solution of chlorate potash..... 4 tablespoonfuls.
Tincture chloride iron..... 1 teaspoonful.

Then touch the most prominent spots with a camel's hair pencil, dipped in the above.

To keep up the strength during treatment add a beaten egg to a goblet of milk with a tablespoonful of brandy in which previously dissolve three grains of quinine, giving a third, morning, noon and night.

When the eruption we have called chicken-pox accompanied the disease, it seemed to act as a counter-irritant, and more fowls recovered when thus afflicted, than when troubled with the throat disease alone.

In the light of our experience we should not try to save a single specimen, but should kill and bury them at once, and attend to the sanitary condition of the remainder of the flock, by giving Fowler's Solution at the rate of one drop to a fowl in the water and continue it for eight or ten days.

Should this disease visit one in the form of an epidemic, it would be no less, and we are fearful, much more fatal than chicken cholera.

BUMBLE-FOOT.

This disease is in very many cases caused by carelessness. Flying down from high roosts to a floor which is always more or less covered by small gravel stones results in bruises that are precisely like what we usually call "stone-galls."

The flesh of the foot being so tough, the pus cannot escape, therefore, if not attended to, it must congeal, and an ungainly, troublesome foot be the result.

The fowl goes lame, and careless of its comfort, we in nine cases in ten fail to investigate in time to prevent serious trouble. When discovered before the pus congeals, lance the swelling at the rear of the foot, and the pressure upon it in walking will press the pus out and there will be a much smaller callous than if allowed to settle down of its own accord.

We have treated cases by making an incision in front and rear of foot, and those on shank by opening at top and bottom, and by the use of a syringe and a solution of carbolic acid, of one part of acid to ten parts of water, cleanse them thoroughly, when they all heal up.

In most cases we are not aware of the trouble till the pus is congealed, when it is almost impossible to press it out unless we take with it some portion of the layers of the foot, which would be worse for the fowl than to use a strong liniment to take out the soreness, and let the inflammation settle down into a corn.

When the swellings are upon the shank or knee-joints, which are generally the result of rheumatism or

gout, the fowl may as well go to the block, for it is a doubtful policy to breed from such a specimen.

But some have a mania for doctoring, in which case use strong liniment, and bind the shanks and joints in leaves or bulbs of the skunk cabbage, and give internally, one drop each morning, of Fowler's Solution, for a month, or bromide of potassium, three grains per day, until the trouble is cured.

Bumble-foot may be prevented in a great degree by providing low roosts and keeping the floor of the fowl-house covered three inches deep with loamy sand, which costs less than to doctor fowls for the want of it.

THE RED SPIDER LOUSE.

This pest is the scourge of the poultry-house, and the source of more trouble and annoyance than any other hindrance to poultry keeping. The quarters often become literally alive with them before the breeder is aware of their presence. They sap the life blood from the fowls and reduce to skeletons and debilitate a flock to such an extent as to make the season unprofitable. Working only in the night, they escape notice and have things their own way.

Fowls that are sitting upon eggs are generally the greatest sufferers, for these lice instinctively seek out such hens as are about to hatch their broods, and many a hen sacrifices her life to her motherhood.

In this case the hen becomes sallow in face and comb—actually bloodless, the lice having consumed the blood to such an extent as to cause death, and many fowls, whose death has been attributed to disease, have been murdered by these pests.

The quarters should be constantly watched, and all the cracks and knots on or about the roosts saturated with coal tar and kerosene oil, or carbolic acid. The houses must be kept free from them, for the exhaustive influence of these marauders not only entails the loss of blood to the fowls, but, by reducing their strength, renders the flock more liable to the diseases we have described.

It is therefore the best and surest step toward warding off disease to have an absolutely clean poultry-house. If from one to three pounds of sulphur be mixed with the loamy sand and gravel covering the floor, in which the fowls may dust themselves, and kerosene oil used as described, the fowls occasionally dusted while on their roosts with a dredging box filled with sulphur and Persian insect powder, or carbolic powder, their quarters will be cleansed. Cleanliness coupled with judicious feeding is what makes fowls profitable. So great a nervous irritant are these species of vermin that in two flocks equally well fed the flock which occupies quarters infested with lice will not lay at all, while those free from this annoyance will lay nearly every day. This fact proves them to be an expensive enemy to the poulterer.

We do not go so far as some writers and say that all disease is caused by lice, but will say that many a fowl would not have suffered disease were it not for this barn or spider louse. Breeders, look for them at all times. Do not wait for them to make themselves known, and force their acquaintance upon you.

DIARRHOEA.

This is most liable to attack chickens under two weeks old, and fowls during incubation, unless one is careful as to the diet given.

In chickens, scalded milk as drink, keeping water from them, will usually correct the evil, but sometimes it seems to visit the yard to a degree almost equivalent to cholera. Discharges resemble oil and snuff mixed, with green streaks through it. The fowl shows great exhaustion, and moves about to all appearance as if no muscles were moved but those of the legs.

Treatment.—For setting hens we have used one tablespoonful of the following mixture in a quart of water, giving them no other drink till cured.

| | |
|-----------------------------|-------------------|
| R. | |
| Sweet Tincture Rhubarb..... | 2 oz. |
| Paregoric..... | 4 oz. |
| Bicarbonate Soda..... | $\frac{1}{2}$ oz. |
| Essence Peppermint..... | 1 dr. |
| Water..... | 2 oz. |
| Mix. | |

With young chicks, if the scalded milk failed to correct the evil, put one teaspoonful of the above mixture in one half-pint of the milk.

Care should be taken to discontinue the treatment when a cure is effected, as one extreme is as much to be avoided as the other.

In the event of a stubborn case in adult birds put one teaspoonful of Squibbs' Diarrhoea Mixture in a pint of water and give as a drink, and generally a cure will follow in from twenty-four to forty-eight hours.

You will see by the formula that this is a very powerful medicine, and much care should be employed in its use :

R

| | |
|------------------------|-------|
| Laudanum..... | 1 oz. |
| Tincture Capsicum..... | 1 oz. |
| Tincture Camphor..... | 1 oz. |
| Chloroform—pure..... | 3 dr. |
| Alcohol..... | 5 dr. |

Mix.

If fruit cans are used as drinking vessels they should be discarded when they commence to corrode, as the rust is an oxide of *tin*, and in many cases brings on diarrhoea. Many a valuable bird has been lost in this way under the erroneous idea that they were getting iron and consequently strength, for where oxide of iron may do no harm oxide of tin is poisonous.



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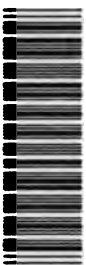
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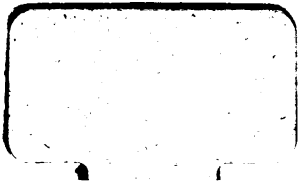
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